

THE TRAVANCORE STATE MANUAL

VOL. III

SADASYATILAKA T. K. VELU PILLAI B. A. & B. L.

Advocate

Deputy President, Sri Mulam Assembly, Travancore

Member of the Senate, The Travancore University

Emeritus Professor, H. H. The Maharaja's Law College

Formerly Member of the Senate,

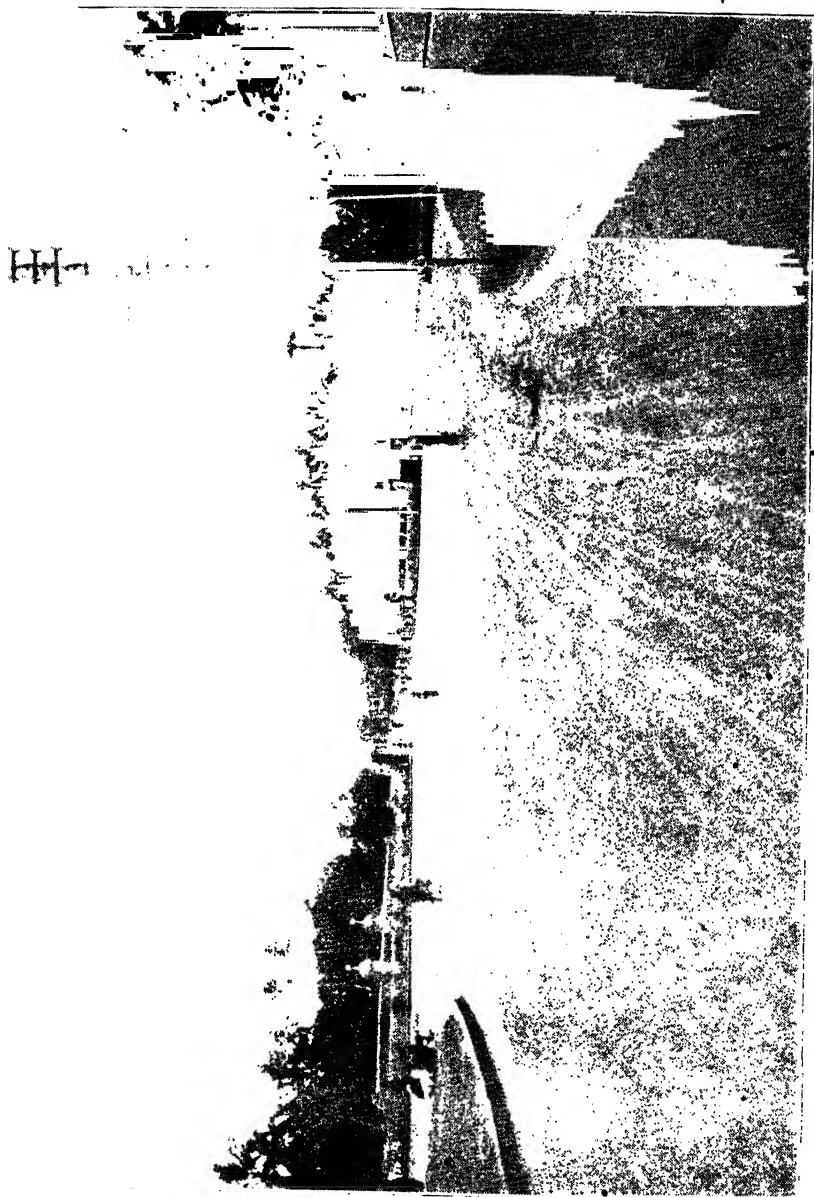
University of Madras.

PUBLISHED BY

THE GOVERNMENT OF TRAVANCORE

1940

PRINTED AT THE
V. V. PRESS BRANCH, TRIVANDRUM.



The • Avenue Road — Trivandrum. •

PREFACE

This volume deals with the economic condition of the State comprehending Chapters XIV to XXVII. In Chapter XIV, I have attempted to present a comprehensive narrative of the measures adopted by the Government for the promotion of the health and strength of the population.

Chapter XV was drafted by Mr. K. S. Narayana Aiyar, B. A., M. L., Advocate. It is a fairly full account of the various tenures, explained in the light of legislation and judicial interpretation. Part I of that Chapter has been added by me to present certain views, which, I hope, will be useful as presenting facts and arguments in a new aspect.

Chapters XVI to XXV were drafted by Mr. G. R. Pillai and approved of by the Heads of the respective Departments. I have taken care to make a detailed study of the different subjects and have had discussions with him at every stage. The accounts are substantially the same as he drafted, the modifications being slight. Mr. G. R. Pillai has brought to bear on the work his extensive knowledge and experience.

In Chapter XXVI I have described with considerable fulness the educational policy pursued by the State during a period of more than a hundred years from the commencement of the reign of Rāṇi Pārvathi Bai, the regent, to the establishment of the University of Travancore by command of His Highness the present Mahārāja, Śrī Chithra Thirunāl. The draft of Chapter XXVII was supplied by the Department of Public Health. It presents a vivid description of the various steps taken by the State for the improvement of public health.

Trivandrum }
28th June 1940. }

T. K. VELU PILLAI.

CONTENTS

GENERAL

	<i>Pages</i>
ECONOMIC CONDITION	1—115
LAND TENURES and	116—222
LAND TAXES	224—246
FORESTS	247—279
• AGRICULTURE	280—413
IRRIGATION	414—430
FISHERIES	431—464
MEANS OF COMMUNICATION	465—497
• ELECTRIC POWER	498—504
INDUSTRIES	505—578
TRADE AND COMMERCE	579—650
INVESTMENT AND CREDIT	651—665
JOINT STOCK COMPANIES and	666—673
CO-OPERATIVE SOCIETIES	673—690
EDUCATION	691—757
PUBLIC HEALTH	758—813

CONTENTS

CHAPTER XIV

ECONOMIC CONDITION

	<i>Page</i>
General	1
Equity of Taxation	4
Life of the Agriculturists	5
Land	6
Size of agricultural holdings	7
Value of land	8
Incidence of Taxation	9
Buildings	12
Occupation	12
Relative position of the agricultural class in the early part of the 19th century	13
Extension of cultivation	18
Agricultural returns and the increase of population	18
Progress in cultivation	20
Facilities for cultivation	21
Manure	22
Livestock	25
Paddy	28
Coconut	31
Tapioca	34
Sugarcane	36
Pepper	37
Plantation crops	39
Tobacco	39
Industries	40
Salt Industry	42
Cottage Industries	44
Fish Industry	45
Mineral Industry	46
Power	47
Communications and Transport	48
Trade	50
Markets	53
Labour	55

	<i>Page</i>
Operatives and Wages	57
Unemployment	61
Economic Depression	63
Indebtedness	64
Relief to agriculturists	68
Banks	71
Loans	72
Investments	75
Rural Reconstruction	75
Income	78
Consumption	81
Seasons of Scarcity	85
The Economic Development Board	87
Conclusion	88
Bibliography	115

CHAPTER XV

LAND TENURES AND LAND TAXES

General	116
Jenmom Lands	126
The origin of ownership in Land	127
Jenmom Lands: origin	128
Ancient organisation of the country	129
Origin of Jenmom Tenures	133
The several classes of Jenmom Tenures	145
Origin of Kānappāṭṭom tenure	147
The main features of Kānappāṭṭom	155
Jenmi and Kudiyan Regulation V of 1071	169
Changes made by the Jenmi and Kudiyan Amendment Regulation of 1108 }	174
Other tenures relating to Jenmom lands	175
Idavakais	186
Sirkar Lands	190
Tenures of Sirkar Lands	195
Different kinds of Otti transactions	205
Land Taxes	224
Early History	224
Survey and Settlement	224
Remission.	233
Bibliography	246

CONTENTS

V

CHAPTER XVI

FORESTS

	<i>Page</i>
Classification	251
Forest Flora	253
Sylviculture	255
Teak plantations	256
Extension	257
Sandalwood plantations	258
Working Plans	260
Exploitation of Forest produce	261
Royalties	262
Teak	264
Transport of Timber	264
Elephants	268
Cardamoms	269
Ivory	271
Protection	271
Grazing	273
Forest offences	274
Concessions	275
Communications	275
Antiseptic treatment of wood	276
Hill tribes	277
Protection of game	277

CHAPTER XVII

AGRICULTURE

Introductory	280
Area under cultivation	282
Soil	285
Season and rainfall	286
Agricultural Holdings	287
Fallowing	291
Implements	293
Irrigation	296
Manure	298
Wet Crops	299

	<i>Page</i>
Paddy	300
Nānjanād	301
Podivitha	302
Onāṭṭukaṛa	309
Kuṭṭanād	311
Kaṛi lands	316
Dry crops	317
Other cereals	325
Edible roots	327
Oil seeds and oils	332
Fibre Crops	337
Monocotyledonous	337
Dicotyledonous	338
Drugs and narcotics	340
Condiments and spices	340
Garden crops	350
Vegetables	364
Fodders	364
Fruits	365
Plantations	370
Agricultural Stock	379
Fisheries	390
Apiculture	397
Poultry	400
Sericulture	401
Agricultural Education and Agricultural Colonies.	402
Agricultural marketing	407
The Board of Agriculture	408
The Imperial Council of Agricultural research and Travancore	410
Bibliography	412

CHAPTER XVIII

IRRIGATION

Nānjanād	414
Kōthayār Project	415
Irrigation in Shenkōṭṭa	423
North Travancore	424
Reclamations	425
Minor Irrigation works	427
Bibliography	430

CONTENTS

vii

CHAPTER XIX

FISHERIES

	<i>Page</i>
An important economic activity in primeval days	431
Natural advantages and wealth of Travancore Fisheries	432
Prevalent species and value of catch under each	434
The problem of fish preservation	436
Indigenous methods of fish preservation	437
Fish products	444
Minor aquatic products from sources other than fish	451
Coral	453
Chank Fishery	455
Sea cucumber or Trepangs	455
Sea urchins	455
Appendix	456
Bibliography	463

CHAPTER XX

MEANS OF COMMUNICATION

Roads	465
Tolls	474
Water Communications	477
Canal Communications	479
Ferries	484
Bridges	484
Railways	491
Motor Traffic	494
Air Transport	495
State Transport	495

CHAPTER XXI

ELECTRIC POWER.

General	498
Preliminary Survey of Hydro Electric possibilities	499
Installation of Thermal station at Trivandrum	500
Supply of Electricity in Kōttayam and Nāgercoil	501
Supply of Power to Quilon	501
Investigations of the Pāllivāsal Hydro Electric Project	502

CHAPTER XXII

INDUSTRIES.

	<i>Page</i>
General statistics	595
Factory Industries	596
Coconut oil	596
Punnac	598
Coir yarn industry	599
Coir Fibre	511
Mats and Matting	513
Oil Industry	515
The manufacture of Tiles	516
Ceramic Industry	516
Sugar	519
Rubber	520
Tea	523
Cashewnut	527
Salt	531
Mining Industry	536
Materials for refractive industry	540
Paper	541
Match	542
Rayon	542
Labour	542
Cottage Industries	543
Cotton weaving	544
Silk weaving	546
Manufacture of Silver and Gold threads	548
Lace and Embroidery	552
Bell-metal Industry	555
Iron Industries	565
Screw-pine mat weaving	566
Wood Seasoning	568
Palm-leaf umbrella making	569
Preparation of coconut jaggery	571
Preparation of palmyra sugar candy	575
Other industries	576
Bibliography	578

CONTENTS

ix

CHAPTER XXIII

TRADE AND COMMERCE.

	<i>Page</i>
General	529
The Interportal Convention	586
Monopolies	594
Direction of Trade	606
Exports	608
Coconut products	611
Imports	635
Internal Trade	644
Currency	645
Bibliography	650

CHAPTER XXIV

INVESTMENT AND CREDIT.

Indigenous banker	651
Chitties	653
Institutions for investment	655
Joint Stock banks	657
The State Aided Bank	661
The State Land Mortgage Bank	663
Credit Bank	663
Remittance facilities	664
Bibliography	665

CHAPTER XXV

JOINT-STOCK COMPANIES AND CO-OPERATIVE SOCIETIES.

Co-operation	673
Progress of the movement	673
The Central Bank	676
Taluk Banks	680
Urban Banks	682
Primary Societies	682
Internal Supervision	684
Non-Credit activities	684
Concessions by Government	688
Bibliography	890

CONTENTS

CHAPTER XXVI

EDUCATION.

	<i>Page</i>
Early account	691
Female Education	692
Further Progress	694
Co-education	696
Missionary enterprise	698
State activity	700
Vernacular Education	704
English Education	708
Technical Education	709
Progress of Education	714
The Education Code	717
Private enterprise	721
Education Reforms Committee	727
Education of Backward Communities	735
Hostels and Boarding Houses	739
Medical Inspection of pupils	740
Boy Scouts Movement	741
Reading rooms and Libraries	742
Co-ordination of Education with the means of living	742
Travancore University	744
Bibliography	757

CHAPTER XXVII

PUBLIC HEALTH.

Historical introduction	758
New Public Health Scheme	761
Control of Communicable diseases	773
Vaccination: Introduction and early Progress	779
Plague control measures	785
Medical Entomology	788
Filariasis Survey	791
Mosquito control operations	796
Public Health Laboratory	799
Health Unit, Neyyāttinkara	803
Rural Sanitation	805

CONTENTS

xi

	<i>Page</i>
Municipal Health work	807
• School Medical Inspection work	808
Public Health Education	810
Miscellaneous	812
Bibliography	813

ILLUSTRATIONS

IN

VOL. III.

Pages

The Avenue Road—Trivandrum	Frontispiece
Kōthayār Dam	21
Wooden Bridge—Thattappalli	49
Padmanābhapuram Puṭhanār	415
Nīṇṭakara Bridge	491
Aerodrome	495
Trivandrum Power House	501
Hydro-Electric Works—Paḷlivāsal	503
Rubber Factory	523
Cashewnut Factory	529
The Pier at Alleppey	607
The Physics Laboratory-College of Science	703
The College for Women	715
The College of Arts	725
The Law College	739
University Buildings	745
The Engineering College	755

MAPS

IN

VOL. III

PAGE

.The Forest Area	... 247
Kuttanad	... 311
Means of Communication	... 465

THE TRAVANCORE STATE MANUAL

VOL. III

CHAPTER XIV

ECONOMIC CONDITION

. The economic condition of Travancore bears the usual marks of the forces of transition from a static to a dynamic

General. stage in the production, distribution and consumption of wealth. The activities of the State and the people are characterised by a consciousness of settled order which has been rendered possible through centuries of well-regulated political and social life; for, while in many other parts of India foreign invasions and social cataclysms made society unstable, Travancore has been able to maintain its traditions and keep to its old moorings in an atmosphere of comparative immunity.

. Travancore is pre-eminently an agricultural country. The population has grown to such dimensions and continues to grow so rapidly that extensive cultivation cannot adequately increase. In many places the law of diminishing returns has begun to assert itself with effects discouraging to labour and capital. But the tilling operations are being pursued in

the time-honoured fashion. Intensive cultivation is as yet only a captivating idea, at least nothing more than an occasional experiment. Plantation crops like rubber, tea and cardamoms are well looked after by the owners who are ordinarily able to command the requisite capital and labour. But the small landholder and the average tenant are hardly able to obtain the best results on account of their limited command over the agencies of production. A large proportion of the latter class merely eke out a hand-to-mouth existence. In the old days that man was happy and respectable who concentrated his effort in tilling his own 'paternal acres', his tharawād properties. Village economy was such that the carpenter, the blacksmith, the washerman and the barber were content to receive the remuneration for their services in kind—a measure of rice or a bunch of coconuts. Wants were few and comforts great. Rarely was the produce of one locality taken to another. But the conditions at present are such that even middle class people are reluctant to work with the spade or hold the plough. Instead of the owners of lands cultivating them, as was the custom, we now find absentee land-lordism and a general disposition to lease out lands for such rents as they may fetch.

In former days the jack, the mango, the tamarind and other trees which produce edible fruits were cultivated with care. But they are seldom planted now and the old trees have been mostly felled for timber or fuel. At present the agriculturist seeks quick returns in preference to a permanent income which takes time to obtain. People are tempted to sell away their lands, especially when they are in small parcels, rather than try their hand at "tantalising agriculture", which, after all, fails to enable them to earn a livelihood. The usual training in schools gives them the incentive to do so. The educational institutions are within easy access throughout the State and even the poorest take the trouble and submit to the

sacrifices involved in sending their children to school, envisaging a prospect of securing employment under government in some capacity or other. So large is the number of boys and girls who come out of the schools and colleges that employment has become uncertain. The large majority find it difficult to make up their minds to earn a livelihood by manual labour. Hereditary callings are abandoned and the children of the labouring classes swell the numbers of the unemployed as much as those of sections of the population which were formerly in a more advantageous position. The earning capacity of the average man has, therefore, suffered. Till recently educated men found it easy to secure employment in British India, Burma, Ceylon and the Straits Settlements. But the general economic depression no less than political exigencies have practically shut the doors to those avenues. The cumulative result of all these developments makes for inaction, disappointment and unrest. The Government is pursuing a steady policy to develop the natural resources of the country and create a better economic environment. "The character of man's natural environment determines the character of his productive activity, of his means of production. The means of production, however, determine the reciprocal relationship of men in the process of production as inevitably as the equipment of an army determines its entire organisation and all the relationships of the individuals of which it is made up. Now the reciprocal relations of men in the social process of production determine the entire structure of society".

The economic condition of Travancore in the opening years of the nineteenth century is thus described by Buchanan. "The bulk of the rural population is contented and prosperous. The whole country presents a most pleasing picture of light but diversified labour, health, content, and comfort unruffled by anxiety, unembittered by rivalries". The condition of the agriculturists in the

Madras Presidency about the same period was far from satisfactory. They were burdened by chronic poverty and heavy debt. Mr. Śrīnivāsa Rāghaviengār in his "Forty Years' Progress of the Madras Presidency" writes about it thus:— "Taking the Presidency as a whole, there can be no doubt that between 1830 and 1850, and more especially between 1835 and 1845, the condition of the agricultural classes was wretched". The land tax first imposed by the East India Company in Madras was one-half of the gross produce of the land. The public revenue during the same period was 45 per cent. of the gross produce and Thomas Munro who was responsible for a portion of the enhancement felt himself obliged to recommend a reduction by a quarter.* It was calculated that out of Rs. 100, the value of gross produce, the government assessment was represented by Rs. 45-12-0 and the expense of cultivation by Rs. 40, leaving a profit to the ryot of only Rs. 14-4-0.† In Malabar the land tax assessed on the landlord was at the enormous rate of 84 per cent. of the rental.‡

But this "State claimed only a very moderate share of the fruits of labour. The land revenue can hardly be said to be a tax on that labour, as it is only a small part of the yield of the soil over and above the fair returns of labour and capital". Much of the State revenue is derived from indirect taxation. In former times the rulers were content to confine their expenditure to the produce of the crown lands and the earnings from the administration of justice besides certain dues and perquisites sanctioned by ancient usage. The

* R. C. Dutt's *Economic History of British India*, p. 135.

† Śrīnivāsa Rāghaviengār, *Forty Years' Progress of the Madras Presidency*, p. 26.

‡ Buchanan's *Journey from Madras, etc.*, Vol. II, p. 369.

militia furnished a sufficient number of men in times of war, the men holding such extents of cultivable land as were appropriate to their rank. The working classes were rooted to the soil, men and women working together for their master throughout the year for wages in the ascertainment of which competition and higgling had little place. The jenmies leased out practically the whole of their lands to the cultivators. The temples owned large estates which were let out to their tenants at a fair and reasonable rent. Land was plentiful and was more than enough to meet the requirements of the population.

“Unlike the people of the other coast, those of Malaya-lam scarcely ever live congregated: their houses are always separate, concealed in fragrant groves, draped by the pepper-vine whose clustering produce, intermingled with the areca, constitutes a portion of the wealth of the possessor; in the more open parts they are embosomed in the deep foliage of the jack the fruit of which forms a material article of subsistence. The houses are much healthier than those of stone and lime. Pūvam, tamarind, cardamoms, wild cinnamon, pepper, cocoa grow without nursing or care”.* “The coconut tree and its fruit supply almost everything necessary for the wants of man. Small ships, houses and roofs are formed of the trunk. Of the husk of the nut ropes are made; and the shell is employed for dishes and spoons. If the fruit be not quite ripe the milk in it affords an excellent, cooling and very wholesome beverage. When the milk is converted into a kernel, an oil is expressed from it. The sap which flows from the branches gives the agreeable well-tasted *sura* and, when distilled, becomes a kind of brandy”.†

* Memoir of the Survey of the Travancore and Cochin States, Ward & Conner, p. 7.

† A Voyage to the East Indies, Fra Bartholomew, pp. 162 and 163.

Land is the most prized species of wealth in Travancore. The recorded total area in 1112 was 48,80,000 acres.

The total area under occupation is 25,47,682 acres, of which 5,98,896 acres are wet lands and the rest dry or garden lands. On the basis of population, the occupied area is 50 cents per head. The total wealth of individuals (according to the Economic Census of 1931) accruing from the ownership of land is given below:—

Land.	Area in acres.	Value in lakhs of rupees.	Percentage of error.
Dry	5,98,000	5,136	
Wet	15,99,000	8,963	+8
Total	21,97,000	14,099	+6

“The margin of error being 6 per cent. for the whole, the total value will be about Rs. 150 crores. The average extent and value of total land, including wet and dry, per earner are 1.62 acres and Rs. 1,041 and the corresponding figures per head of the population are 0.43 acre and Rs. 277. As there is an error of 6 per cent. in the latter, the correct averages may be taken to be 0.45 acre and Rs. 294 respectively”*. Nowhere else in India has the subdivision of land been carried to such an extent as in Travancore. The distribution of land, as it exists now, is mainly the result of social customs, the laws of inheritance and the legislative enactments made from time to time. The Nāyar, Īlava, and Nānjanād Vellāla Regulations passed during the penultimate decade have accelerated the process and brought about a complete disintegration of the properties belonging to these communities.

* Travancore Census Report, 1931, Vol. I, p. 472.

Travancore is a country of small holdings. Of the total number of holdings about 6 per cent. are less than 20 cents in extent, about 26 per cent. less than 60 cents, 38 per cent. less than 5 acres, and 95.5 per cent. less than 10 acres. Only 4.5 per cent. are 10 acres and more. If ten acres is considered to be the minimum size of an economic holding, only less than 5 per cent. of the holdings are economic. The proportion of agriculturists to earners is the highest among the Nāyars. The large majority of Brahmans have leased out their lands. In former days the marumakkathāyam law of inheritance helped the tharawāds to function as economic corporations. But the passing of the Nāyar, Īlava and other Regulations provide for the division of ancestral property, enabling individuals to claim their share and alienate them as they choose. The institution of separate property helps the natural instinct for the acquisition of wealth. But, on the other hand, it leads to fragmentation of land rendering many persons landless by setting a premium on alienation. Individualism is replacing the old system of joint production by family corporations.

The greater facilities for transfer which have resulted from legislation have enabled certain communities which formerly possessed little or no land to purchase more.

Statement showing the value of transfers.

Period	Value in rupees		
	Sales per year	Mortgages per year	Hypothecations per year
1093—1095 (1917—1920)	193 lakhs.	144 lakhs.	218 lakhs.
1096—1100 (1920—1925)	221 „	164 „	234 „
1101—1106 (1925—1930)	303 „	153 „	298 „
1107—1109 (1931—1933)	172 „	103 „	192 „

The table given above shows that generally the amounts under hypothecations exceeded those under sales and mortgages. This points to the fact that in raising loans on the security of lands the landholder would, so far as possible, try to retain its possession and enjoyment. There was an abnormal increase under sales in the period between 1101-1106 (1925-1930). That was the period in which the Nāyar and the Īlava Regulations came into operation. The averages under all transactions for the period 1107-1109 (1931-1933) are rather low. This is due to the economic depression.

The Government has made a beginning in assigning lands to backward communities the members of which had long been serfs or labourers earning a small wage. The Sachivōṭhamāpuram colony near Kōttayam and the Vaṭṭiyūrkāvu colony near Trivandrum are worthy of mention. But in the very nature of things they can serve only as demonstration centres.

In a country like Travancore, with a wide range of soils and physical features materially affecting the conditions of agriculture, land values vary widely.

Value of land.

The prevalence of a variety of tenures and the system of inheritance are the modifying factors. The nature of the soil, the facilities of communication, nearness to markets, conditions of labour and prices of crops go to determine the price of land. On account of the deep-rooted belief that investment on land is the safest, the average price of land is very high considering the return. The following table shows the average value of land from 1100 to 1109 M. E.

Year	Average value per acre in rupees		Index Number
	Wet	Garden	
1100 (1924-25)	566	359	89
1101 (1925-26)	673	401	100
1102 (1926-27)	733	386	101
1103 (1927-28)	735	413	107
1104 (1928-29)	777	405	107
1105 (1929-30)	779	391	105
1106 (1930-31)	653	403	102
1107 (1931-32)	533	394	93
1108 (1932-33)	518	366	87
1109 (1933-34)	405	347	77

It will thus be seen that the value of land rose steadily till 1104 (1928-29) but began to decline from 1105 (1929-30) and that it has been steadily falling since. The price of wet land has fallen by about 50 per cent., that of garden land by about 16 per cent. and that of land in general by about 30 per cent.

The revenue of the State is derived mainly from (i) direct taxation, (ii) indirect taxation, (iii) commercial services and (iv) levies in connection with specific services. The incidence of taxation per head of the population in the case of land revenue from 1102 to 1112 is given below:—

Incidence of
taxation.

1102	0.96 Rs.
1103	0.93 „
1104	0.95 „
1105	0.95 „
1106	0.76 „
1107	0.76 „
1108	0.67 „
1109	0.76 „
1110	0.77 „
1111	0.72 „
1112	0.75 „

The incidence of income tax per head of population for the years 1102-1112 is as follows:—

1102	4 chs. 3 cash	(2 as. 4 ps.)
1103	5 chs. 2 cash	(2 as. 10·5 ps.)
1104	do. do.	do.
1105	do. do.	do.
1106	4 chs.	(2 as. 2·855 ps.)
1107	3 chs. 6 cash	(1 a. 10·74 ps.)
1108	3 chs.	(1 a. 8·21 ps.)
1109	2 chs. 10 cash	(1 a. 5·68 ps.)
1110	3 chs. 3 cash	(1 a. 9·47 ps.)
1111	3 chs. 4 cash	(1 a. 9·89 ps.)
1112	3 chs. 15 ca.	(2 a. 2 53 ps.)

The incidence of salt tax per head of the population from 1100 to 1112 is shown below:—

1100	6·60	as.
1101	5·50	„
1102	6·70	„
1103	7·60	„
1104	7·50	„
1105	7·40	„
1106	5·83	„
1107	6·21	„
1108	6·17	„
1109	6·21	„
1110	6·10	„
1111	6·80	„
1112	6·90	„

The following table gives the incidence of taxation in the State from 1100 to 1111 under the various items of taxation revenue.

Statement showing the incidence of taxation from 1100 to 1111 (figures in lakhs of rupees).

Heads of taxation	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111
Taxes on income	Rs. 7.89	Rs. 5.11	Rs. 5.40	Rs. 6.40	Rs. 6.96	Rs. 6.56	Rs. 6.31	Rs. 5.00	Rs. 4.31	Rs. 3.81	Rs. 5.22	Rs. 4.86
Salt	16.81	16.31	16.89	19.17	18.85	18.76	18.57	22.05	21.68	22.26	22.11	21.80
Excise	45.57	48.91	52.37	55.64	61.43	61.21	48.11	48.15	51.45	48.22	47.98	45.30
Customs *	26.68	28.71	30.22	31.56	32.51	34.66	34.95	27.14	43.60	49.69	39.26	40.88
Excise duty on matches	...	...	...	...	...	...	...	...	...	...	3.22	1.37
Stamps	25.12	26.95	26.93	28.61	27.72	27.27	22.88	24.02	23.50	25.16	22.59	20.88
Registration	7.42	8.35	8.78	9.81	99.40	8.84	6.43	6.26	5.64	5.28	4.92	4.53
P. W. tolls	1.14	1.76	2.53	3.07	4.24	4.54	5.14	3.90	4.14	4.42	5.56	6.53
Total	130.63	136.10	143.12	154.26	161.11	162.14	142.39	137.32	154.32	147.90	150.86	146.15
Land Revenue	38.99	42.09	42.25	41.62	4.77	39.69	38.62	38.47	33.91	37.10	30.36	36.12
Total including Land Revenue	169.62	178.19	185.37	195.88	202.88	201.83	181.01	175.79	188.23	185.00	181.22	182.27
Payment per head of population												
(i) Exclusive of Land Revenue	3.7.7	3.11.4	3.16.3	3.23.15	4.0.12	4.1.5	2.22.4	2.19.7	3.0.12	2.25.4	2.26.14	2.24.5
(ii) Exclusive of Land Revenue and Cochin Harbour Receipts	...	...	...	...	...	...	2.22.4	2.19.7	2.21.11	2.20.4	2.20.10	2.16.13
(iii) Inclusive of Land Revenue	4.6.11	4.12.11	4.17.12	4.25.2	5.2.0	5.1.1	3.15.9	3.22.10	3.19.7	3.17.10	3.15.9	3.16.2

* The figure for 1108 includes a sum of Rs. 12.94 lakhs being the net receipts from the Cochin Harbour.

Next to land house property is the most important item of wealth in Travancore. The number of persons returned at the Economic Census as possessing buildings. houses is 724,160 or 53·5 per cent. of the total number of earners. The aggregate value of houses and the averages per owner, per earner and per head of the population are given below :—

Aggregate value of houses.	Rs. 1,843 lakhs.
Average per owner.	Rs. 255 „
Average per earner.	Rs. 136 „
Average per head of population.	Rs. 36 „

According to the Census Commissioner the total value and the average *per capita* value are Rs. 1,990 lakhs and Rs. 39 respectively. “The *per capita* value according to the Travancore Banking Enquiry Committee varies from Rs. 16 to 71 in certain taluks and Rs. 76 to Rs. 124 in Thōvāla and Shenkōtta.” From a special enquiry made in the case of the backward communities “it is seen that most of their dwellings are hardly worth more than Rs. 5 each and that the average value is only between Rs. 8 and 9.”

At the time of the last census it was found that of the total population of 5,095,973 in the State 1,477,388 were earners, 929,906 were working dependants, and 2,688,679 were non-working dependants.

There has been a general increase in the working population engaged in most of the occupations during the past decade. There is also a general tendency on the part of the members of certain castes to give up their ancestral professions and to take to new ones. This is most marked among the Īlavas whose traditional occupation is followed only by 38 in a thousand. The Census Commissioner attributes it to the “anti-drink campaign of the prohibitionists”. It is not less probable that the spread of

education has infused into them a higher sense of dignity in professions as well. Toddy-drawing is now followed only by the poor. "Among the Īlavas more than 30 per cent. of the workers are agriculturists and over 22 per cent. are industrialists". The next community the members of which are fast giving up their traditional occupation is the Brahman. Only 161 in a thousand earners follow the traditional occupation of priesthood. Of the remaining 84 per cent. 26 are agriculturists, 12 are traders, nearly 15 are public servants and about 11 are lawyers, doctors and teachers. The Pulayan, the Kuravan, the Parayan, the Veluṭhēdarāyar and the Kammāḷan may be mentioned as the castes more than 80 per cent. of the members of which are adhering to their traditional occupations. The population engaged in agriculture and allied occupations increased from 668,849 in 1921 to 941,777 in 1931, an increase of nearly 5 per cent. This large increase is chiefly due to the breaking up of maṛumakkathāyam families by the partition of the common properties into individual shares. Taking the working population of 1931, it is seen that 39 per cent. of them are engaged in agriculture, pasturage, hunting and fishing; about 15 per cent. in industries, a little less than 2 per cent. in transport, about 7 per cent. in trade, a little over 3 per cent. in public administration and the professions, nearly 30 per cent. in domestic service and the remaining 5 per cent. in unspecified and miscellaneous occupations. It is evident from this that agriculture is the main occupation of a large section of the population.

Writing in 1820 Ward and Conner observed : " Of the

Relative position
of the agricultural
class in the early
part of the 19th
century.

agricultural class the Nāyars constitute the largest body of farmers; the Christians also possess a good deal of this kind of property which they are generally increasing; but the Lubbays, in proportion to their number, are

more opulent in this particular; not one twelfth of the Chovans have lands; the descendants of the Portuguese and Dutch can scarcely be said to possess any". On the whole there is a tolerably equal division of this species of property; in the maritime districts they are sub-divided into very minute shares; the exact number of those holding lands has not been ascertained, but the accounts of sixteen districts give a register of 123,799 persons as paying the garden tax. It must, however, be remarked that the same cultivator will hold both rice lands and gardens.

"Subsistence is almost entirely derived from agricultural labour, nor do the temptations of commerce attract even the wealthier classes from rural pursuits which are most esteemed, the handicraft professions being abandoned to the very lower ranks, nor does the practice of them always secure a certain livelihood".* Land was abundant especially on the hills. Mādhava Rao who became Dewan in 1858 visualised a comprehensive scheme of increasing the output of wealth. He observed: "The regions near the Ghats present considerable margin for the extension of cultivation. In spite of the difficulties arising from the deficiency of labour, from the depredations of wild beasts and the attacks of jungle fever the use of the plough is gaining ground. Land is also reclaimed from swamps near the coast. The mountainous tracts rich in soil and other natural facilities were being neglected. The districts of Thodupulā, Paṭhanāpuram, Nedumangād, Mūvāttupulā, Iṇachil and Kottārakkaṛa were the most backward in agriculture". The land tax realised from those backward taluks were only Rs. 18, 59, 78, 82, 115 and 142 respectively per square mile, while in the coastal taluks it was Rs. 1,546 in Agasthīswaram, 1,076 in Ampalapulā, 1,275 in Kārthigappally and 1,158 in Parūr.

The people were superior to their neighbours in many things that exalt one class above another. Speaking in

* Memoir of the Survey of the Travancore and Cochin States : Ward and Conner.

1871 Rev. Matear observed:—"Considerable activity in industrial and commercial pursuits, elementary arts and agriculture, prevails in Travancore, so that a large proportion of the people are usefully occupied in various forms of productive labour. All the ordinary occupations essential to civilised life are carried on, often in a style very primitive and different from that of European workmen, but still practically efficient according to native ideas". The extension of agriculture was also facilitated by the increase of trade. In 1029 M. E. the exports were of the value of Rs. 13,93,356 and the imports Rs. 9,04,806. In 1028 they were 55 lakhs and 20 lakhs of rupees respectively. From the second quarter of the nineteenth century the condition of the agriculturists began to improve as a result of the steady growth of trade. There was a bounding increase in the quantity of exports and imports, as is evident from the following tables.

Exports.

Articles.	1029	1030	1031	1032	1033	1034	1035	1036	1037
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Coffee	6,553	17,775	11,861	16,166	13,228	16,770	8,397	68,807	37,370
Coin	92,427	1,12,028	90,125	1,08,433	1,07,152	1,41,140	1,51,763	2,67,926	5,93,926
Jaggery	38,997	52,903	26,214	30,327	63,042	24,099	23,414		43,695
Copra	4,24,434	3,81,365	4,53,174	5,57,583	5,83,829	6,97,788	6,13,064	7,78,098	15,89,445
Dry Ginger	1,06,856	1,30,583	95,328	93,814	1,17,756	1,31,293	1,39,682	1,69,189	1,53,853
Chickney	2,36,522	2,50,748	2,65,153	2,32,482	2,64,469	2,45,384	3,13,209	3,52,466	3,85,742
Tamarind	50,240	62,882	90,409	40,384	53,888	60,292	69,428	51,749	82,711
Dry fish	29,344	28,462	30,633	45,269	32,428	37,752	29,715	44,729	99,509
Coconuts	41,365	45,628	49,988	41,549	46,088	65,732	58,221	69,332	1,46,210
Timber of several descriptions	36,148	77,590	67,953	76,921	94,503	90,312	89,123	89,130	82,583
Punnaca oil	31,316	11,554	9,409	21,067	17,908	33,097	20,752		67,772
Coconut oil	1,27,395	2,02,257	1,04,566	1,61,995	1,74,938	98,018	1,09,024	2,17,121	1,34,649
Sugarcane jaggery	19,371	38,679	41,836	20,369	25,731	43,831	32,591	51,749	69,044
Turneric	11,204	12,888	24,451	30,320	42,336	33,088	14,070	.....	.....
Total	12,52,172	14,05,342	13,61,100	14,76,679	16,37,296	17,19,590	16,72,453	21,60,296	34,86,509

Imports.

Articles.	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038
Opium	10,251	14,508							37,161	47,481
Iron	28,571	33,481							64,195	70,435
Cuminseed	14,333	8,499							18,370	19,568
Thraw	24,370	46,068							33,805	55,120
Copper	14,910	23,431							51,491	89,784
Sugar	18,520	8,634							25,315	39,865
Cotton of different sorts	1,98,393	1,87,377							1,50,517	1,10,532
Garlic or Onion	20,939	5,695							26,765	28,207
Chillies	24,515	25,685							53,240	51,820
Thread	51,181	79,227							98,175	1,17,104
Wheat	6,150	5,669							...	...
Coriander	6,415	6,138							...	...
Piece goods	2,95,552	1,29,228							5,64,866	6,70,017
Bullocks and buffaloes	42,033	63,296							21,132	34,594
Snuff	...	...							10,841	10,284

Figures not available.

Eighty years ago the opening up of the mountainous tracts for cultivation was essential to progress. But the operations were limited by the amount of capital, the quantity of labour and the degree of enterprise then available in the country. The people of the plains were, as a rule, unwilling to shift their habitations to mountainous districts, though by no means remote; to endure separation from friends and families; to brave the difference of climate, and to contend with malaria and the wild animals of the jungle. The Government was therefore inclined to offer special inducement to attract outsiders. Concessions were given to coffee planters. General Cullen, the British Resident, Śrī Viśākhom Thīrūnāl, then 1st Prince, and Sir T. Mādhava Rao, the Dewan, were glad to own estates on the hills. "The Sirkar felt satisfied that the country would largely benefit by the introduction of capital, skill and enterprise of Europeans in utilising tracts of valuable land which for the most part would otherwise lie untouched for generations. A large number of European planters took advantage of the opportunity offered. The natives reclaimed wastes in the plains and the Europeans utilised the forests on the mountains—the two classes thus working apart and peaceably".*

Eighty five thousand acres of land, mostly virgin forests, were sold to Europeans and a few Indians. The price per acre which was fixed originally at one rupee rose to Rs. 80. After a time Government decided to stop further sales. The exports of coffee rose to 45,700 cwts. in 1879-80. But the price fell soon after. The leaf disease reduced the yield. Coffee estates were abandoned one after another.†

The income derived from agriculture has become inadequate to meet the increasing demand for the necessities

* The Administration Report of Travancore.

† Report on the Forests of Travancore, T. F. Bourdillon.

of life. The pressure of population on the cultivated land increased enormously. The table below shows the rapid increase in the population.

1816-1820	906,987
1836	1,280,668
1854	Almost the same.
1875	2,311,379
1881	2,401,158
1891	2,557,736
1901	2,952,157
1911	3,428,975
1921	4,006,062
1931	5,095,973

The quantity of paddy (rice) produced in the State falls far short of the demand. Imports of paddy and rice consequently increased year after year. The reclamation of backwaters, the development of tea and rubber industries and the extension of cultivation over large areas of waste land have relieved the pressure to a certain extent. But the food problem is becoming more and more difficult. The following figures relating to the import of paddy and rice are instructive* :—

Year.	Value of paddy and rice imported. Rs.
1874-75	6,69,000
1880-81	9,74,203
1890-91	11,09,448
1900-01	28,44,551
1910-11	80,69,954
1911-21	1,72,25,953
1921-31	1,75,62,343
1936-37	2,68,08,207

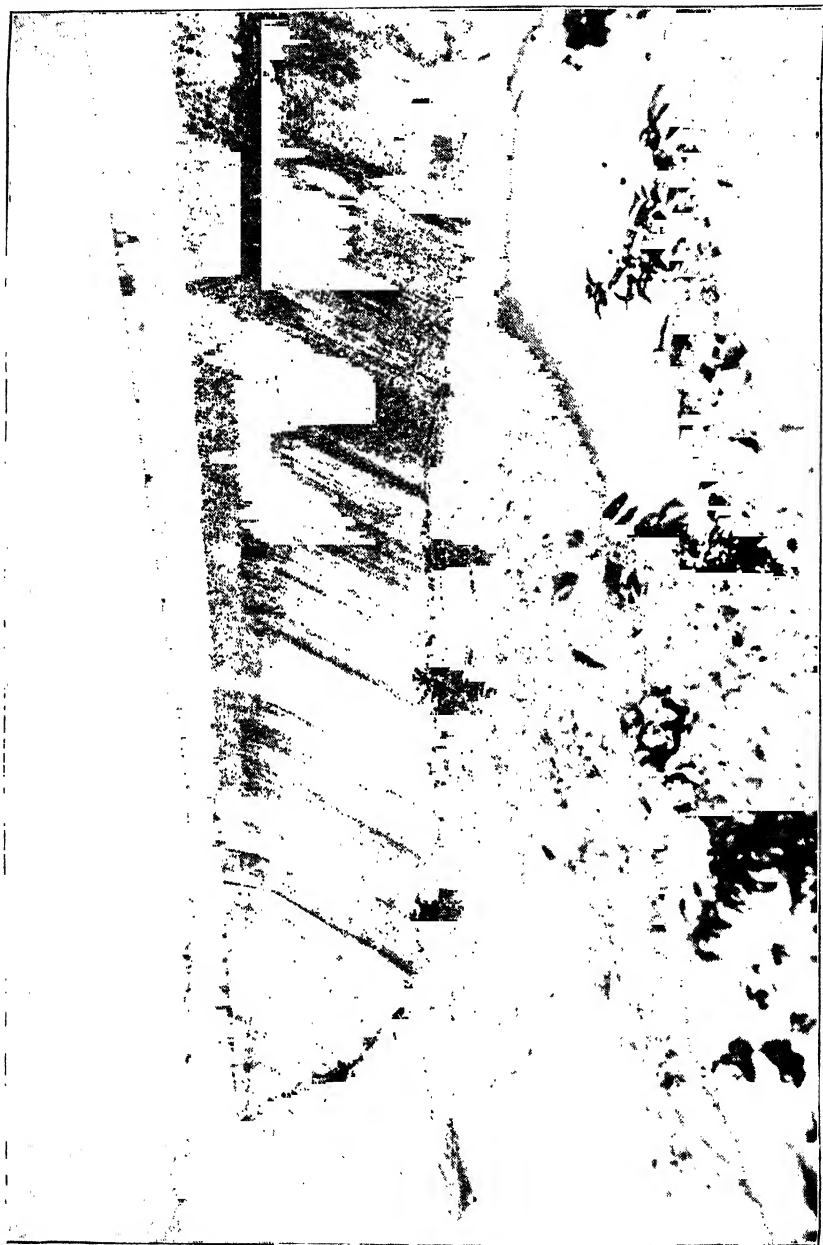
* For detailed figures See the Appendix.

The average annual imports of paddy and rice during the period 1108-1110 (1933-1935) were 1·3 million cwts. and 6·4 cwts. respectively. The total value of the imports in 1112 amounted to 3½ crores of rupees—a very serious drain. Thus the quantity of paddy imported has increased more than 26 times.

The number of people supported by agriculture, including non-working dependants, according to the census of 1931, is 2,768,000, which is equal to

Progress in cultivation.	54·3 per cent. of the aggregate population.
	77·2 per cent. of the value of the total production of the country is represented by that of agricultural produce, whereas all the other sources put together account only for 22·8 per cent.

“ In 1095 (1919-20), the total area of land under occupation was 20,81,039 acres consisting of 5,00,883 acres of wet land and 15,80,156 acres of dry land. In 1104 (1928-29), the year before the setting in of the depression, the total area of land under cultivation was 25,23,008 acres, made up of 6,04,916 acres of wet land and 19,18,092 acres of dry land; that is to say, during the ten years preceding the depression, the agriculturists of Travancore brought under occupation 1,04,033 acres of wet land and 3,37,936 acres of dry land. The conversion of 20,000 acres of dry land into wet in South Travancore and the reclamation of about 50,000 acres of backwater in Kuttanād during the past two or three decades bespeak the enterprise of the agriculturists of those tracts under cultivation. The agricultural expansion in the uplands unfolds the same kind of progress. Between 1100 (1924-25) and 1109 (1933-34), 88,715 acres of land were assigned for cultivation. The increasing population has spread itself to the unopened and undeveloped tracts in the interior, building homesteads and planting their holdings with coconut, jack, mango trees, pepper-vine and a variety of other economic plants. There has been remarkable increase during this period in the area



Kothayar Dam.

grown with paddy, coconut, tapioca, tea, rubber and pepper.

The soils of Travancore are not rich in phosphates, and organic matter. But there are certain exceptional advantages. Practically the whole of Travancore except the three taluks of Thōvāla, Agasthīswaram and Kalkulam in the extreme south and Shēnkōṭṭa has a tolerably good rainfall. In the three taluks of the south the deficiency is made good by artificial irrigation from the Kōthayār Project, and a tank system maintained by Government. The average rainfall in the major portion of Nānjanād is but 40 inches. In this region lie extensive paddy lands covering nearly 55,000 acres irrigated under the above scheme with channels and distributaries of a total length 322 miles. Lands served by the Kōthayār Project command practical immunity from drought. But of late the supply is inadequate on account of the failure of the rains. The only other part of Travancore where artificial irrigation exists to a large extent is the Shēnkōṭṭa taluk, where the area irrigated is 9,473 acres, nearly 8,500 acres lying in patches and mixed up with British territory. A scheme to lift water by electricity to high level lands on the banks of the Periyār in Kunnathunād taluk is under investigation. The work is to begin with the proposed supply of electrical energy from the Pallivāsal Hydro-Electric Scheme. The programme of providing facilities for minor irrigation in the other taluks is being pushed on.

In North and Central Travancore frequent floods cause considerable damage to crops, especially paddy. In some measure the Periyār Dam has prejudicially affected the interests of agriculture in several taluks of North Travancore. In the course of the investigation of the Periyār Project T. Rāma Rao, Dewan Peishkar of Kōṭṭayam, wrote "Were it not for the super-abundance of water in this river

(the Periyār) paddy cultivation miles in extent will probably have to be abandoned to the great detriment of the sirkar exchequer and to the complete ruin of whole villages". He added "Any measure to diminish the water supply will, therefore, injuriously affect many a part of North Travancore. It may perhaps bring in a good return to the government but it cannot satisfactorily compensate for the losses which the people and the country will suffer in consequence". These apprehensions are justified by recent happenings.

Closely connected with the agricultural prosperity of Travancore is the problem of manures. The expansion of extensive cultivation is limited by the
Manure. extent of land available. The forest reserves are being maintained intact. While from 1921 to 1931 the population increased by 24·8 per cent. the cultivated area has increased by only 9·6 per cent. It is hardly necessary to point out that in the very nature of things emigration cannot give any relief, for there is no emigration possible in large numbers. In these circumstances the only means of self-help consists in improving agriculture and making it yield larger returns. The most important step in that direction is to make provision for natural recuperation of the soil. As the result of the analysis of soil samples selected from different parts of the State, the Director of Agriculture says: "In more than 90 per cent. of these soils both nitrogen and phosphoric acid are the chief limiting factors for crop growth. Small wonder that, while the average out-turn of paddy per acre is 5,000 pounds in Spain, 3,000 pounds in Italy and 2,500 pounds in Japan, it is only 1,250 pounds in Travancore". The defect has to be corrected. The remedy usually suggested is the application of artificial fertilisers like ammonium sulphate, superphosphate, sodium nitrate, ammophos, etc. But these feritlisers require for their effective action the presence

of the necessary proportion of organic matter in the soil. A too liberal use of these manures destroys the structure and texture of the soil. The researches of Col. M'Carrison of the Pasteur Institute, Coonoor, of the Imperial Agricultural Chemist in India, of Mockeridge of Bottomley in Europe and of Clerk and Roller in America have proved that the seed obtained from a plot manured with artificial fertilisers does not give as good a crop as that given by crops raised by the application of organic manure. The latter crops are richer in vitamins. Thus not only will the crops become poor by the use of artificial manures but the food of the people will lack in nutrition. The lands in Travancore except in certain parts of Kuttanād are deficient in organic matter or humus. This is especially so in the sub-montane tract, comprising the belt of land running from Kunnathunād, Muvāttupūḷa, Thodupūḷa Minachil, Kunnathur, Adur, Kottāraḱara and certain parts of Trivandrum. The soil of this region comprising several thousands of acres is a useless residue of silica and iron oxides, the valuable ingredients so essential for the successful growth of the plant having been leached out by rainfall on account of deficiency in humus. This dearth of organic matter is also strikingly illustrated in the soils of the entire coastal tract. Even the large areas of paddy soils in Nānjanād, which are supposed to be very fertile, suffer considerably from a lack of sufficient supply of organic matter.

It should be the endeavour of all who are interested in agriculture to ensure a steady supply of organic substances in the soil by the application of farm-yard manure. On this aspect of the question the outlook of the Director of Agriculture is still more pessimistic. According to him the cattle manure now available is not sufficient to meet even a twentieth of the quantity required. The total number of cattle in the State is two hundred thousand and sheep seventy thousand. It has been calculated that the total quantity of manure which may be produced in

Travancore would not amount to more than 5 lakhs of tons which, if distributed over the 22 lakhs of acres of cultivated land, will provide only one-fourth of a ton per acre. The minimum required for proper manuring is five tons per acre. The case of green leaf manure is equally discouraging. In the old days the higher lands adjacent to paddy fields belonged to the owners of the fields. Sometimes they were held in common for the benefit of the villagers. Green manure was collected from the government lands as well. But all these sources have undergone diminution. The fragmentation of land as a consequence of frequent partition leaves but little space for the planting of manure trees such as Konna, Pūvaṛaśu, etc. Waste lands have been brought under assessment and indiscriminately registered to individuals, very often to speculators who have no local interests. The Rules of the Forest Department, designed no doubt for conservation, prevent the ordinary ryot from taking advantage of the free pass system. In these circumstances the careful utilisation of waste materials like night soil is imperatively called for. The example of Japan and China in the conservation of waste products for use as manure is worth following. At present the annual loss to the country by the wastage of night soil is one crore of rupees and the depletion of the soil makes for permanent deterioration a danger which has to be guarded against with meticulous care in view of the great increase of population. If night soil and city refuse are made into a compost under aerobic conditions, it may be advantageously used for all crops, paddy, coconut, sugar-cane and vegetables. Experiments conducted with compost in paddy fields has demonstrated that while ordinary farm yard manure gives an average yield of 170, night soil compost applied in equal doses gives 274. The manufacture of compost must be encouraged for hygienic reasons as well. If the waste products are used, there will be no accumulation of dirt in streets and backyards and practically all

the infection which is now carried from the filth to the food and water supply will have been removed.

“The impoverished nature of our soils is reflected not only in the low yields but also in the deterioration of our livestock which are supposed to carry on their patient backs the entire superstructure of our agriculture. All our natural pastures are not ordinarily deficient in the requisite nutritive substances, especially in minerals like calcium and phosphates; and feeding on these, no wonder our cattle specimens are so puny and dry. For their improvement also, it is of the utmost importance that we should fertilise our soils with organic and phosphatic manures in a liberal manner”.

The manure question is intimately connected with that of livestock. The dependence is reciprocal. But in Travancore the attention paid by the farmer to the proper maintenance of livestock is not sufficient. The cattle are comparatively small in size. It is often said that this is due to the difficulty of finding suitable pasture. This is not correct, for it is well known that grass grows luxuriantly in most parts of the State. Even in the hot season a large quantity is available.

Cattle play an important part in the agricultural life of Travancore. The killing of cows was in former times considered a great crime. It is seen

Livestock. that in early days such offences were punished with death.* The cattle of Travancore are of a non-descript type consisting of small animals, the males of which are inefficient workers and the females poor milkers. Ward & Conner, writing a century ago, said: — “The domestic cattle are less scanty in number than wretched in appearance, at least for a part of the year when a scorched and scanty herbage affords them subsistence; they get

* Ōla, 881, Churūna No. 1063 (C. V. R. Office).

little else but grass, as the consideration which the cow enjoys Enumeration gives the number of black cattle equal to two hundred and ninety one thousand three hundred and seventy seven ; that of buffaloes at ninety one thousand four hundred and five, the total giving on an average fifty-seven to the square mile, which will be increased to eighty-eight if we deduct the hilly extent. The amount of stock might be increased, although it is at present greater than in some European countries". The Census Commissioner (1931) has endorsed this view. He observes that "the stock in the country was far too heavy for the grazing available". The Agricultural Department has rendered substantial help towards the improvement of cattle by the introduction of superior milking breed of Scindhi cows, by encouraging its breeding by the sale of young stock to the public and by introducing grants to private persons for the maintenance of good breeding bulls. Some effort is being made to improve the grazing available on existing grass lands. The cultivation of fodder crops is being popularised among the ryots. Considering the large areas of forests, it is possible to make a large number of silos in different centres where the grass collected in favourable weather may be reserved in order to be used as fodder. Nothing substantial appears to have been done hitherto in that direction.

The number of cows and she-buffaloes in Travancore, as per the census of 1931, is 441,588 and 22,752 respectively, thus giving a total of 464,340 milch cattle in the State. The number of milch cattle per 1,000 of the population thus works out to 91, while the corresponding figure for British India is 197. The great disparity in the number of she-buffaloes and cows is due to the fact that there is a prejudice against buffalo's milk despite the fact that it is richer in fat content.

Dairying as a business concern is still in its infancy in the State. According to the census of 1931 there are 6,706

persons in Travancore engaged in stock-raising as shown below :-

Cattle and buffalo breeders and keepers	5,124
Breeders of transport animals	232
Herdsmen, shepherds and breeders of other animals.	1,350

Effort is being made for a proper marketing of cattle to enable the people to breed them more efficiently. The Government Dairy Farm at Trivandrum is giving the lead to the enterprise. The Thirumala Kshirā Vyavasāya Mahiḷa Co-operative Society advances loans to its members for the purchase of milch stock. The Trivandrum Cattle Breeding Co-operative Society, Ltd., also is working in this line.

The following table shows the imports and exports of oxen and buffaloes during the period 1932—1935.

Year.	Imports.		Exports.	
	Oxen.	Buffaloes.	Oxen.	Buffaloes.
1932-33	5,490	326	2,931	82
1933-34	3,583	507	2,329	49
1934-35	4,847	777	1,465	57

The subjoined statement shows the area in acres under the principal crops in 1112 M. E. (1936-37).

(Crops-Main divisions.			
Crops.	Area under cultivation.	Crops.	Area under cultivation.
Paddy.	6,63,184	Tea.	77,726
Coconut.	5,77,418	Coffee.	6,279
Tapioca.	4,23,692	Pepper.	90,911
Sugar cane.	13,145	Ginger.	23,731
Rubber.	97,125		

Rice is the staple food grain of the country ; and of the different crops cultivated in Travancore, paddy occupies the largest area. It will be seen from the

Paddy. * following figures that of late the area under paddy cultivation shows a diminution in some measure instead of an increase since 1102 (except in 1107 and 1108).

Year.	Area in acres.
1101	6,68,240
1102	6,73,178
1103	6,70,864
1104	6,69,275
1105	6,65,087
1106	6,58,522
1107	6,96,474
1108	7,01,808
1109	6,90,995
1110	6,90,625
1111	6,90,226
1112	6,63,183

Paddy is cultivated throughout the State in all places which afford even the barest facilities. Kuṭṭanāḍ and Nānjanāḍ are the two principal paddy growing areas available in large blocks. The punja lands of Kuṭṭanāḍ fall under two heads, kaṛappāḍams and kāyal reclamations. The reclamation of portions of the Vēmpānāḍ lake and their conversion into paddy fields were the results of a steady policy inaugurated by the Government in the reign of Śrī Muḷam Thirunāl Mahārāja. It was objected by the Government of Madras on the ground that if the backwater was filled up it would affect the depth of the water in the Cochin Harbour. Successive Dewans put forth their efforts to establish the right of the Government to push on with the conversion. But the main credit should in justice go to the

* For the value of import of paddy see Appendix.

late Mr. A. H. Bastow who was the Chief Engineer of the State for many years. But for his persistent efforts the arguments of the engineers of the Madras Government would have prevailed with the authorities against reclamation.

The reclamation work had actually begun before 1009 M. E. The Government gave the ryots special inducement not only by exempting them from the payment of taxes for some time but also by granting liberal loans. But in 1903 (1078-79) the British Government advised the Travancore Government to order the stoppage of the reclamation. The Dewan immediately interdicted its progress. The restriction was to extend over the whole area of the backwater that was affected by the rise and fall of the tide at the Cochin Bar. Mr. Bastow pointed out that the water draining into the lake was the run off from about 2,320 square miles of Travancore territory, that the Cochin Bar had little or no natural claim to the tidal flow, and that it could not be maintained with any justice that "an embargo should be laid on reclamation at a distance of 40 miles from Cochin and 24 miles from the farther side of the next bar". Many were the persons who were interested in hanging up the whole business. Mr. Bastow, however, took so much interest in the matter that the Chief Engineer of Madras and the Government of the Presidency accepted his views and withdrew their objection. The kāyal reclamation scheme which resulted in an increase in the output of Travancore paddy is an abiding monument to the memory of the great engineer.

The reclaimed lands yielded excellent crops and were therefore in great demand. So long as the price of paddy was good, the cultivators were prosperous. The production is on a large scale as that alone would meet the cost of bunding up the fields, draining of the water, and making the land fit for sowing. The difficulty with this system of cultivation is that if the rains set in early the crop will be totally

destroyed. There is therefore a great element of chance. The cultivators are also under a recurring difficulty to find money to meet the expenses of cultivation.

Table showing the price of paddy in Kutṭanād.

Year.	Price per standard para.		
	Rs.	chs.	c.
1095	1	9	6
1096	0	23	7
1097	0	25	13
1098	0	23	12
1099	0	23	2
1100	0	26	0
1101	0	24	5
1102	0	24	4
1103	0	24	8
1104	0	20	10
1105	0	18	12
1106	0	15	10
1107	0	13	0
1108	0	13	0
1109	0	10	8
1110	0	11	0
1111	0	11	0
1112	0	12	8

In Nānjanād, 'the granary of the south', paddy cultivation is carried on an area of 55,000 acres irrigated by the Kōthayār Project. Manuring is a necessary essential of profitable cultivation. The price of paddy there for the last thirteen years is given below:—

Year.	Price per para.		
	Rs.	chs.	c.
1101	0	27	8
1102	1	25	0

Year.	Price per para.		
	Rs.	chs.	c.
1103	0	26	0
1104	0	24	8
1105	0	20	0
1106	0	15	0
1107	0	17	0
1108	0	16	0
1109	0	13	0
1110	0	16	0
1111	0	15	0
1112	0	16	0

The following facts will bear out the inadequacy of the paddy grown in the State. In the seven years from 1050-1056 M. E. the average cost of rice and paddy imported into Travancore was Rs. 12,11,611, which, calculated on the total population, worked out the import value at chs. 14 c. 10 per head. For the decade 1057-1066 the average of the total import was Rs. 15,00,381 and that per head was chs. 17 c. 7. For the next decade the corresponding figures were Rs. 24,70,120 and chs. 27. The figures for 1077-1086 were Rs. 52,22,373 and Rs. 1 chs. 21 and for 1087-1096 they were Rs. 1,41,61,305 and Rs. 4 chs. 3 respectively. For 1097-1106 the average import value was Rs. 2,64,20,189 and that per head Rs. 5 chs. 3.

Next to paddy coconut is the chief money crop in Travancore. 5,77,418 acres are now under Coconut. coconut. "The principal industries in Travancore to-day are those connected with the produce of the coconut palm, viz., the manufacture of coconut oil, the retting of coconut husk, the spinning of coir yarn and the weaving of coir mats and matting". The total value of the exports of these products is over four crores of rupees per year, forming nearly a third of the total value of all the exports.

The area under coconut cultivation has been fluctuating, as will be seen from the following table.*

Year.	Area in acres.
1101,	5,10,452
1102	5,22,669
1103	5,04,044
1104	5,26,950
1105	5,63,048
1106	5,49,567
1107	6,64,899
1108	6,62,132
1109	5,66,725
1110	5,75,340
1111	5,77,340
1112	5,77,418

In recent years the prices of all coconut products have fallen considerably. This is due mainly to competition in the usual markets. The use of coconut oil in manufacturing processes has also been reduced by the substitution of other oils. To this must be added the effect of the general economic depression. The table below shows the rapid fall in the price of copra from 1100.

Year.	Price per candy.		
	Rs.	as.	p.
1100	112	10	8
1101	105	2	6
1102	89	14	4
1103	110	12	8
1104	95	3	10
1105	75	8	1
1106	57	8	8
1107	66	0	0

* These figures taken from the Statistics of Travancore do not appear to be reliable. The area under coconut cannot fluctuate in this manner.

Year	Price per candy		
	Rs.	as.	p.
1108	39	0	0
1109	39	0	0
1110	45	0	0
1111	57	0	0
1112	61	0	0

The prices of the other coconut products also unfold the same tale. This perhaps is due to the general economic depression. The coconut cultivators suffered greatly in another direction as well. Ceylon came into the field and began to make strenuous efforts to capture the Indian market. The exports from that country which amounted only to 1,361 cwts. of copra in 1930 rose to 4,86,000 cwts. in 1933 and 6,43,185 cwts. in 1934. The number of raw nuts imported into India from Ceylon, which was 19,438 in 1930, rose to 37,00,000 in 1933 and 62,40,023 in 1934. The price of the total quantity of Ceylon copra imported into India in 1930-31 was only Rs. 21,000. In 1931 it amounted to nearly eight lakhs. The profits of coconut cultivation in Travancore are also seriously affected by a kind of disease which makes the yield poor in quality and quantity. "The cultivators and the exporters say that the export duty and the present high tariff valuation are serious handicaps to them. But for these, they maintain, there would have been keen competition for Travancore copra from the Cochin, Bombay and Karachi mills and the result would have been better trade and higher prices". The *Kēṛa-karshaka Sangham* an association of coconut growers, has been doing considerable propaganda work to check the importation of Ceylon coconuts by levying a protective duty. Deputations were more than once sent to represent their case to the Government of India. The Government of Travancore have been interesting themselves in securing a favourable decision from that Government. But no such thing has hitherto been sighted.

Tapioca is one of the important crops. The area of cultivation which extends over 4,23,692 acres is next in importance only to that under coconut.

Tapioca. Tapioca is easily propagated. It thrives in all kinds of soils. It is the food of the poor but the middle classes also take it in one form or another. There was a growing increase in the area under its cultivation till 1106. From that year there is a steady decrease, as may be seen from the figures below :—

Year.	Area in acres
1101	4,21,508
1102	4,01,334
1103	4,52,450
1104	4,86,237
1105	4,80,689
1106	4,98,379
1107	4,75,631
1108	4,58,715
1109	53,242
1110	4,42,753
1111	4,41,547
1112	4,23,692

In recent years the cultivation of tapioca has been much restricted. "This was due to the very low price of tapioca. The price in 1104 was Rs. 20 per candy of 672 lbs. of dried tapioca chips. This fell to Rs. 8-14-0 in 1105, a level at which even the cost of cultivation would not be met. The hardships of the cultivator may be understood when it is remembered that the net income per acre is estimated at Rs. 30 in normal times". The price varies from year to year and from season to season.

The price of tapioca is governed by that of rice in some measure, as the former is a substitute for the latter in the dietary of the poorer classes. *Less rice means more*

tapioca. If paddy sells cheap the demand for tapioca necessarily decreases. The following table gives the value of exports of tapioca for the last thirteen years.

Year.	Value. Rs.
1100	6,22,698
1101	5,27,857
1102	2,28,962
1103	6,89,551
1104	3,17,564
1105	2,83,146
1106	1,35,487
1107	2,27,113
1108	1,39,562
1109	46,522
1110	14,471
1111	1,16,288
1112	1,74,907

The quantity exported forms but a small proportion of the output for which, however, no statistics are available. The price of tapioca for the last thirteen years at the capital (Chālai) is given below :-

Year.	No. of lbs. per Br. Re.
1100	40
1101	40
1102	56
1103	56
1104	...
1105	114
1106.	100
1107	75
1108	104
1109	112

Year.	No. of lbs. per Br. Re.
1110	95
1111	99
1112	76*

Sugarcane is cultivated along the river banks and in other low-lying places. Its cultivation has attained considerable prominence in the State. The following statement shows the area under cultivation of sugarcane from 1100.

Year.	Area in acres.	Year.	Area in acres.
1100	7,169	1107	11,819
1101	26,810	1108	12,367
1102	84,574	1109	13,024
1103	25,180	1110	12,701
1104	7,380	1111	15,025
1105	22,766	1112	13,145
1106	9,811		

The average yield per acre is 2 tons of crude sugar, familiarly known as molasses. The total quantity produced falls short of the internal demand. Travancore imports large quantities of refined sugar, the value of import for 1112 M. E. being Rs. 16,10,269. This can be minimised by extending the cultivation of sugarcane. Sugar may also be manufactured from jaggery for the production of which large numbers of coconut, palmyra and chūṇṭapana palms afford ample facilities. The chūṇṭapana (Sago palm) grows spontaneously in the submontane taluks. It is seldom cultivated. The spathe of this palm yields large quantities of toddy. Jaggery is occasionally made but it is more usually utilised for making pāni, a syrup made of sweet toddy, which is greatly appreciated. The policy of the Excise Department has for many years been to strictly control the manufacture of sweet toddy from the sago palm. The control has

practically placed a ban on the tapping of this palm for sweet toddy. This will be seen from the fact that the total number of trees tapped for sweet toddy in 1112 was 216, while it was even less, 199 in 1111, 177 in 1110, 104 in 1109, and 112 in 1108.

Kēraḷa had a virtual monopoly in the pepper trade of the world for several centuries. Even at the present day this

State contributes a third of the world production. The Alleppey pepper always commands in the London market a higher price than the pepper from Singapore and other places. The price of pepper has fallen very much during the last decade.

Year.	Price per candy.*	Year.	Price per candy.
	Rs.		Rs.
1104	600	1109	134
1105	500	1110	151
1106	250	1111	142
1107	140-200	1112	120
1108	198		

This rapid fall in the price has brought about very great financial strain on the cultivators of the pepper vine.

The following table gives the annual wholesale prices of staple commodities for the years 1102—1111 M. E.

* The figures have been taken from the Economic Depression Committee Report. But they do not agree with the figures given in the Statistics volumes.

Table showing the annual wholesale prices of staple commodities from
1102 to 1111 M. E.

Commodities	1102	1103	1104	1105	1106	1107*	1108*	1109*	1110*	1111*
	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.	Bh. Rs.
Coconut oil per cd.	139.64	169.89	159.74	116.38	89	102	70	61	62	85
Copra do.	90.91	114.6	106.14	76.07	62	66	39	39	45	57
Coir yarn do.	83.23	85.16	80.97	80.08	50	47	32	43	39	45
Dry ginger do.	134.90	130.87	179.27	155.2	105	67	57	74	109	184
Pepper do.	371.81	510.83	502.48	396.39	199	198	134	151	142	120
Jaggery per pair of cakes	chs. 9.10	chs. 9.04	chs. 7.79	chs. c. 7 15	chs. c. 6 0	chs. c. 5 12	chs. c. 5 7	chs. c. 5 8	chs. c. 5 8	chs. c. 4 12

* These commodities were not produced in the Devikulam division and were also not available there on wholesale.

Tea and rubber are the chief plantation crops in Travancore. Many are the estates opened on the hills within the last fifty years. Tea occupies 77,726 Plantation crops. acres. In 1112 M. E. 3,07,80,610 lbs. of tea to the value of Rs. 1,96,22,922 were exported. The export rose to 3,32,35,348 lbs. the total value being Rs. 2,25,61,823. The area under rubber is 97,125 acres. The cultivation is not confined to the hills. In the days of boom many people in the lower tracts cut down yielding coconut trees to make way for rubber. The sudden rises and falls in the price of rubber in the foreign markets make the profits uncertain. The Rubber Restriction Scheme which has resulted from international agreement is making the price somewhat steadier, though the profits are much smaller than in favourable times.

Another lucrative crop on the hills is cardamom. The Ēlamala tract and the neighbouring hills produce very good stuff and Travancore supplies the world demand in large measure. In 1112 the export was 8,834 cwts., which rose to 13,064 cwts. in 1113. The total values were Rs. 19,10,698 and Rs. 33,01,512 respectively.

Tobacco was not cultivated in Travancore till recently. But the demand for the article is steadily growing.

In 1933-34 the total demand for tobacco of Tobacco. all kinds amounted to 1,26,92,298 lbs. and that for 1934-35 to 1,16,25,397 lbs. The imports are from Jaffna, Tinnevely and Coimbatore. The following table shows the total quantity of tobacco (all kinds) imported from 1930 to 1935.

Year.	Quantity.
1106 (1930-31)	1,26,60,303 lbs.
1107 (1931-32)	1,23,95,846 „
1108 (1932-33)	1,24,89,869 „
1109 (1933-34)	1,26,92,298 „
1110 (1934-35)	1,16,25,397 „

Calculating the *per capita* consumption of tobacco (all kinds) in the State on the population as recorded by the census of 1931, it comes to 2 28 lbs. costing Rs. 1.02. The *per capita* consumption of cigarettes is .16 oz. or 4.5 cigarettes, and that of beedies is .3 lbs. or about 350 beedies of average size valued at approximately Rs. 0.8-6. The members of the Popular Assembly and the Legislative Council have often represented to Government the necessity of opening tobacco plantations and recently a beginning has been made for the cultivation of tobacco in the State. The dry lands in South Travancore appear to be the most suited for its cultivation. The table in the Appendix shows the quantity of tobacco products imported into Travancore.

In former days Travancore had no large scale industries. But the accounts of foreign travellers bear testimony to the fact that the people of the
 Industries. several places had their own methods of manufacturing their necessities. Fra Bartholomew who visited the Malabar Coast in 1776-1789 observed that in Quilon there were "a great many weaving looms as well as manufactories of cotton and stoneware. Various articles of household furniture were also made here of *Ayani*, *Benga*, *Teke*, and *Bitti* wood. Even at present the most ingenious artists on the Malabar Coast reside at Collam". Several varieties of cloth were manufactured at Kōṭṭār, Bālaṛāmapuṛam, Chirayinkil, Panthalām and some other places. They are consumed in the neighbouring towns. At Kōṭṭār and Quilon a coarse gunny used to be manufactured. Umbrellas made from the leaf of Kodappana were popular till some time back, but they have fallen out of fashion and become rare. A variety of mats and wicker-work are neatly made by the lower classes. The number of persons supported by industries is comparatively high in Travancore. The following table gives the number so supported from 1901 to 1931 and their percentage to the total population.

Year	Population supported	Percentage to total population
1901	519,325	17·9
1911	588,410	17·1
1921	720,837	17·9
1931	771,312	15·1

Textiles, wood, metals, ceramics, manufacture of chemical products, food, dress and buildings are the most important industries in the State. The following figures show the number and percentage of the population engaged in each of the industries in 1931:—

Industry	Number in 1931	Percentage	Variation since 1921, per cent.
Textiles	130,590	37·0	8·6
Wood	55,253	15·7	15·3
Metals	13,493	3·8	4·2
Ceramics	9,302	2·6	7·4
Chemicals	11,610	3·3	13·4
Food	56,167	16·0	19·4
Dress	42,156	12·0	4·8
Buildings	17,024	4·8	344·6
Miscellaneous	13,737	3·9	9·6

Of the total population of 351,076 engaged in industries, 24,511 (7 per cent.) only are factory workers. This shows the preponderance of cottage industries. Factory industries are gradually coming into prominence. Even from 1883 attempts were made to foster suitable industries. At Colachel in South Travancore, where the Danes formerly had their Indigo factory and which till sometime back was the outlet for the coffee produced on the Ashambu hills, steam machinery had been brought into use. In 1883 cotton mills and a paper mill were started with private capital helped by a subvention from the Government. The policy pursued by the Government in helping large scale industries has resulted in the springing up of numerous factories, such as, the coir factories, the cotton mills, the tea and rubber factories, the cashewnut factories, the sugar factory and the match factory. But it has to be regretted that several of them whose working was undertaken by the Government had to be closed or handed over to private agencies. The Thenmala Match Factory which, if properly conducted, would have been able to make use of the resources of the Travancore Forests in the preparation of matches is now practically doing no work. The Rubber Factory which began its work with great hopes had to be given over to private agency.

The manufacture of salt is a profitable industry in Travancore. Formerly all the salt required for consumption was made in the Alams in South and the
 Salt industry. Padanays in Central Travancore. In the taluks of Trivandrum, Chirayinkil, Kaṛunāgappally, and Kārthigappally the margin of backwater gave facilities for the manufacture. The industry being free of tax and free from any kind of state control, provided means of livelihood for many, especially among the poorer classes. But as the Travancore salt found its way into British India, not infrequently through smuggling, Col. Munro who was Dewan

and Resident prohibited the manufacture of salt except as was undertaken on behalf or on account of the Sirkar. Even the stuff which was in the possession of the subjects was ordered to be delivered up on pain of a heavy penalty. Thus was a monopoly created, a system which cut at the root of salt manufacture. Most of the former manufacturers stopped their trade on account of the low prices fixed by the Government. Factories were abandoned. The quality of salt produced deteriorated as a consequence of the indifference of the Government which wanted only to get some quantity of salt, however inferior, at a low price to be paid to the producers after delivery. The payment was made long after delivery. The fall in quality set a premium on the importation of Bombay salt, which held the field for many years until recent times. The Interportal Convention equalised the selling price of salt in Travancore with that in British India. The locally made salt of inferior quality and the imported Bombay salt of higher quality were thus treated similarly as regards the price. This being an injustice to the consumer, it was decided to close the padanays in Central Travancore. The sites were converted into paddy fields or coconut gardens. For nearly a century the Government did not take much interest in the culture of salt except as regards the revenue which they might obtain from the monopoly. In 1079, however, a lease of 120 acres of land was given to a private company on condition that they would sell to the Government and that the latter would purchase the whole or a stipulated quantity of salt at a fixed price. The Government were to sell the same to the public. The excess, if any, might be sold by the producer himself in the open market subject to the payment of a duty imposed by the Government on issue. This was known as the Modified Excise System. This gave an inducement to capitalists to open new factories. Regulation III of 1088 empowers the Government to supervise and control the manufacture. There are now fifteen factories scattered in

Thāmarakkulam, Rājākkamangalam, Coḷachel and Kanyākumāri. The insufficient supply of good brine, the percolation of fresh water from the Kōthayār Irrigation channels and the unfavourable conditions of weather sometimes affect the production. However, Travancore is self-sufficient in salt, the total output being 12,56,989 maunds in 1113. The average consumption per year is 12 lakhs of maunds.*

Travancore has all the materials for a widely inter-linked system of cottage industries which will furnish subsidiary occupation to the agriculturists.

Cottage industries. "Various cottage industries have, for centuries, obtained a firm foot-hold in the country and cotton weaving and coir making, wood and ivory carving, screw-pine work and carpentry are well known for their artistic excellence throughout the world". These industries, if properly encouraged, will provide work and the means of subsistence to a good portion of the population. The textile industry is one of the most popular. Under this term is included weaving, lace-making, knitting and embroidery. With a view to encourage cotton weaving among the depressed classes, the Government decided in 1103 that the itinerant weaving parties should do more intense work in the areas inhabited by such people. Each party is directed to halt in a place for a sufficiently long period to train a batch of pupils so that they may adopt cotton weaving as an occupation. Practically this amounts to the establishment of temporary cotton weaving schools in areas where cotton weaving has not made any head-way.

Coir-spinning is a thriving cottage industry all along the shores of the backwaters. To make this a large scale factory industry means that many thousands of poor workers will be deprived of their income, meagre though it be,

* For figures relating to production, import, sale, revenue, and revenue per head see table in Appendix.

which they now obtain from the spinning of coir-yarn. The coir industry is a very prominent item making up the commercial wealth of Travancore. This is one of the most progressive factory industries. The quality of the coir rope is excellent and is appreciated throughout the world, especially its elasticity and strength. From the unsettled nature of cottage industries it is not possible to gauge accurately their progress from year to year. The technical schools in the State are mostly for teaching cottage industries. The majority of them impart instruction in cotton weaving, which is fast spreading. Carpentry, smithery, coir work and rattan and bamboo work also figure among the subjects.

The long sea coast, the extensive backwaters, the numerous fresh water streams and the vast expanses of punja fields afford excellent places for fish and for developing this lucrative industry.

Fish industry. "The fisheries of Travancore are already an item of considerable importance. Nearly 20 per cent. of the shank fisheries of the world is contributed by 'Travancore'. The number of persons returned at the 1931 census with fishing as their principal occupation is 38,120 and as subsidiary occupation 1,110, totalling 39,230 in 1931 as against 33,402 in 1921. The annual catch of fish in Travancore is estimated to be of the value of Rs. 125 lakhs. The export of fish and fish products has been on the increase. There is great scope for establishing several subsidiary industries among the fishing folk. These will surely be an excellent measure for the pecuniary betterment of the poor folk. The extraction of oil from fish has begun to be popular. "A well-directed extension of the programme for the education of fishermen and the spread of co-operation among them can easily lead to the rapid expansion of the industry", and "during recent years, the enterprising fisher community has, under the far-sighted supervision of philanthropic agencies,

developed the lace industry which has acquired a name for delicacy and durability".

Travancore is not rich in minerals, though it possesses some of the most valuable and rare ones. Monazite, ilmenite and zircon are finding an increased market in Europe and America. Graphite, magnetite and mica are also found in the certain localities. It is believed that one of the main handicaps for industrial progress in the State, viz., the absence of cheap power, will be overcome by the inauguration of hydro-electric schemes. There are several companies in the State carrying on mineral industry. For years mineral licenses were granted by the State. Whole areas have been leased out. Of late it has been realised that there was a tremendous amount of buying and selling of lands and speculative application for mineral licenses. "We came to the conclusion that this kind of thing must stop and that the State must derive an adequate revenue, an adequate share of the profits which the people are making.....The production and marketing of ilmenite and silliminite are in the hands of a world combine. Until the facts are ascertained and our fair share of profits ascertained, the Government do not propose to hand over any of the mineral resources to prospectors. Of course we are bound to honour the contracts that have already been entered into, we are bound to carry out in the spirit and in the letter the contracts which are existent. No new licenses will be given to anybody unless Government after investigation are able to see what are the net profits which the venting can bring and what is the proper share which Government might obtain from that amount. This policy again is in furtherance of the idea that these being natural monopolies of the State, they must be exploited to the best advantage and the State must get the best profit out of it".*

* The Dewan's speech.

The growth of industries depends on the availability of labour-saving processes. "Industrial development in other countries generally coincides with the development of the coal industry, of the iron industry and of the textile industry.....Now Travancore has no coal resources. Travancore has very little of iron resources.....Travancore possesses in abundance what in recent years has been fast replacing coal and iron. Travancore possesses what has been described in America as white coal. Resources of river and stream, perennial streams advantageously placed, enable Travancore, at comparatively small cost, to develop electrical power. The first of such hydro-electric enterprises—I hope it will be the first link in a chain -- is the one that has been initiated at Pallivāsal. It will bring to your cities and your towns, to your villages and your cottages, cheap power in an abundant measure. And cheap power is the beginning of industrial growth".*

The only river from which electric energy is now generated is the Muthirappula. But there are many more which may be utilised with advantage. Among the additional sources of electric energy are the following:—

The Kaldurutti, Minmutti and Ottakkal are alternative sites for developing power from the Kuḷathūpula river. Minmutti, 43 miles from Trivandrum, appears to be the most favourable. The catchment area of the stream is 115 square miles and the fall 250 ft. in two miles.

Kaki Aṛuvi and the Pampa. It is a tributary of the Pampayār with a catchment area of 82 square miles. The banks are rocky and precipitous and the site is far away from human habitations. The estimated power is 3,000 H. P. There are nearly a dozen falls in the Pampayār. Some of these have a fall of 450 ft. It may be possible to utilise any and all of them by making the water of one

* Speech delivered by the Dewan after laying the corner stone for Sir Victor Sassoon's Bleach Mill near Alwaye, 1936.

discharge into the head works of the other and thus collect the power available from the several falls at the end of the last one. There was once an idea with the British Government to divert the waters into the Periyār Lake. Some investigation was made by them. This Government has not attempted any on their own account.

Tual Falls. Catchment 73 square miles, the falls 250 ft. and minimum discharge 10 causecs. The British Government made an investigation to examine the possibility of diverting the water into British territory with the help of a dam.

Karimbankuṭhu. Catchment 300 square miles, fall 600 ft. and minimum discharge 150 causecs. In the probable line of the leading channel there is hardly any rock except very near the end where a tunnel for about a mile will be required. The quantity of electrical energy available will be enormous.

Perumbankuṭhu. Catchment 120 square miles and dry weather discharge 80 causecs.

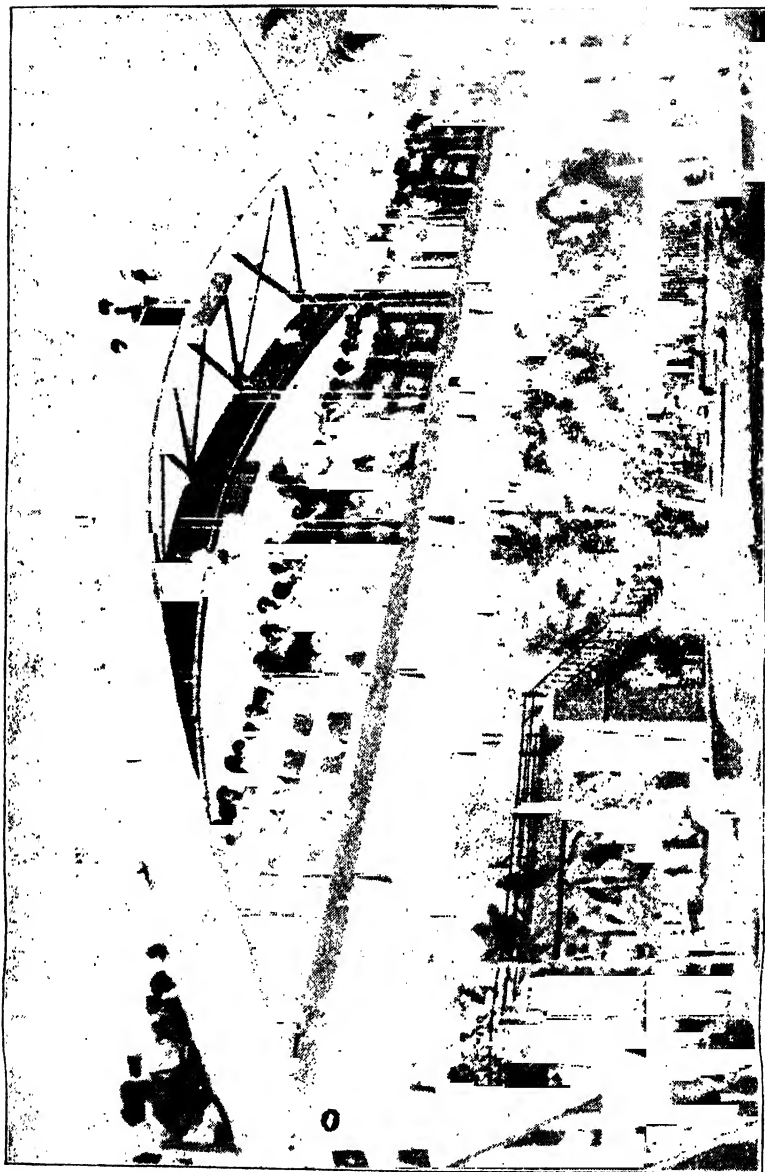
Valiyāttumukam in the Kōthayār. Though it has a fall of 1,200 ft. the catchment area is very small and the discharge only 15 causecs. The banks are deep on all sides.

Kombekani in the Neyyār. Catchment area 5 square miles, discharge 8 causecs and fall 50 ft. in a mile. A high dam is required.

If some of the rivers are harnessed, there is a certain prospect of generating as much power as the State would require for the due expansion of its industries. It may be possible to supply cheap power to places beyond the borders of the State.

The development of communications in recent years has brought about great changes in the social life and economic conditions of the people. Travancore has an almost uninterrupted line of natural communication in its extensive river and backwater system which forms a cheap highway

Communications
and transport.



Wooden Bridge, Thottappalli.

for traffic from the extreme north as far south as Trivandrum. Forty five per cent. of the trade of Travancore is carried on by the backwaters. The quick transport of agricultural products in buses and lorries from villages and up-country parts to towns and the other markets has contributed largely to the growth of internal trade. The huge drain from the country which entails on motor transport was deeply deplored. In 1931 the amount spent on the item was Rs. 45 lakhs. "Some go to the extent of maintaining", so says the Economic Depression Committee Report, "that all our ills are to be traced to the indulgence in this exotic luxury. We find that the question of motor transport is fast becoming a matter of concern to the State".* This hope has since been realised and the Government have taken over the transport business. Speaking in 1936 the Dewan said: "Facilities for trade and commerce and an efficient system of transport, transport which is not a monopoly in a few hands, but transport which is managed, canalised and controlled by the State, so that unlike what is happening in America and even in Europe it would not be possible for one organisation, one corporation, to deflect trade in particular channels, to discourage some kinds of business and to encourage some others", are to be meted out by the Government and "that is why the Government of Travancore has made up its mind to establish certain modes of control and supervision of the system of traffic in the country, without handicapping, without throwing obstacles on private enterprise". The inaccessibility of the tea and cardamom gardens to the people of the State has been one of the reasons for the employment of foreign labour in these estates. Till 1930 there was practically no proper road communication between the plains and the High Range. It was chiefly the want of communication which hindered the migration of labour from the plains. "Firmada taluk which has long been

* For figures relating to the value of import of motor cars, cycles, accessories, and petrol, see Appendix.

connected with the plains by a good metalled road contains much larger proportion of local labour than Dēvikulam. The Nēriamangalam-Pallivāsal road should, therefore, lead to a larger migration of local labour to the tea gardens in Dēvikulam taluk. ... If the people of this country are ready to migrate to the hills and demonstrate their fitness for work in the tea gardens, they could gradually replace the labourers from the East Coast and no less than 75,000 of them could thereby get employment.”*

The development of transport has thus been a blessing to the farmers. Stores, provision shops, tea shops, etc., are springing up in the neighbourhood of important motor junctions and railway stations. The Census Commissioner says:—“The development of motor traffic has contributed largely to the increase in the number of hotels and tea shops in 1931. In towns and important villages one can hardly walk a few yards without passing one of them”.

The facilities for the cheap transport of goods due to an extensive backwater tract and a network of roads have to a great extent increased internal trade,

Trade. which gives employment to 176,648 persons. Commercial speculations engaged the attention of even the earliest kings of Travancore. Travancore has had dealings with foreign nations from the remotest period, and pepper, cassia, arecanut, etc., were bartered for Chinese, Arabian and Roman goods. Shipments were made to the ports of Cochin, Calicut, Bombay, Karachi, Calcutta, Rangoon, Colombo and Jaffna. Even two hundred years ago there was an officer designated “*Mulakumaṭiśśīla Kāryakkār*” to supervise and control trade.

The produce of the coconut palm, pepper, ginger, turmeric, arecanuts, cardamoms, rubber, tea, cashewnut, the produce of the palmyra palm, tapioca, ilmenite, monazite, zircon, timber, hides, fruits, eggs, etc., are some of the

* Travancore Census Report, 1931, Vol. I, p. 87.

important local produce which are exported in large quantities. The chief items in our imports are paddy and rice. Articles of luxury are also imported in large quantities.

It was the Interportal Convention which opened out greater facilities for imports and exports. The following table shows the value of exports and imports and the total value of trade for each decade from 1030 to 1100, and after that for each year.

Year	Value of exports Rs.	Value of imports Rs.	Total value of trade Rs.
1030	18,11,408	6,36,938	24,48,346
1040	46,47,829	...	...
1050	75½ lakhs (Approx)	45 lakhs (Approx)	120½ lakhs (Approx)
1060	1,08,21,137	85,53,948	1,97,75,085
1070	1,68,67,834	1,03,67,530	2,72,35,364
1080	1,71,48,056	57,41,246	2,28,89,302
1090	4,18,20,726	2,93,36,797	7,11,57,523
1100	9,70,96,131	5,70,98,244	15,41,94,375
1101	10,26,54,128	5,93,79,863	16,20,33,991
1102	11,40,65,138	6,16,43,268	17,57,08,406
1103	11,84,08,817	8,23,81,910	20,07,90,727
1104	11,80,42,935	9,32,90,681	21,63,33,616
1105	11,29,39,039	9,36,10,748	20,65,49,787
1106	9,65,15,615	7,65,58,897	17,30,74,512
1107	7,51,16,153	6,49,29,804	14,00,45,957
1108	7,71,08,954	6,43,99,262	14,15,08,216
1109	7,78,97,856	6,29,16,056	14,08,13,912
1110	8,37,66,683	7,91,51,279	16,29,17,762
1111	8,16,00,000	7,43,00,000	15,59,00,000
1112	9,22,92,577	7,42,39,341	16,65,31,918

In recent years the situation created by the heavy fall in the prices of agricultural produce and the consequent shrinkage in the value of both exports and imports has been very acute in Travancore. The price of coconut and its products has reached a low level. So also the prices of other agricultural products like pepper, ginger and other spices which form a good part of the principal exports. The coir industry which for long remained the virtual monopoly of the State has suffered much. There has been a tremendous fall in the prices of coir goods in foreign markets, in many cases exceeding 50 per cent. The value of the export of coir goods through the ports of Alleppey and Cochin fell from over Rs. 2½ crores in 1929-30 to less than Rs. 1½ crores in 1933-34. The total value of trade which amounted to more than Rs. 21 crores in 1923-24 fell to Rs. 14 crores in 1933-34.

The unfavourable turn that our imports are taking has to be deplored. The rapid increase in the import of food-stuffs and luxuries is out of proportion to the increase in the value of exports. In 1911 the *per capita* value of exports was Br. Rs. 16.01, of imports Br. Rs. 14.58 and of the total trade Br. Rs. 30.59. The figures showing the *per capita* value of exports and imports show a balance of trade in our favour to the extent of Br. Rs. 1.43 per head of the population. This balance is, however, approaching the vanishing point.

As has been stated above, the import of luxuries has increased to an extent out of all proportions to the average income. In the Asiatic Review of 1930 Mr. M. E. Watts wrote thus about the economic condition of this State:—"It may be that this adverse position is only a passing phase; but it is no less likely that the position may get worse in view of the increasing demand for foreign goods to meet the developing requirements in luxuries and the conveniences of life which the higher standards of a more complex civilisation make more and more insistent. Another factor is that rapidly growing production elsewhere might retard

proportionate expansion in the demand for raw produce for which it has so far found a ready and steady market.”*

The internal trade is mostly conducted by petty merchants and middlemen. The small mofussil traders buy the goods from the urban traders and the rural shopkeeper supplies the requirements of his customers in the neighbourhood. Ordinarily these include condiments, salt, oil, sugar, imported piece-goods, hardware, etc. The village shopkeepers have very little capital. Retail prices are generally high. Business is often done on credit.

A good deal of business is transacted in the numerous markets which are distributed throughout the State. Except rubber, tea and cardamoms most of the
Markets. articles for export and for local consumption are brought to the markets to be sold. The work of distribution is in the hands of middlemen. There are markets of all descriptions; some public, others private, some held daily, others weekly, bi-weekly, tri-weekly, etc. Almost all the markets are connected by roads the vast majority of which are fit for motor traffic and the rest for country carts. This has promoted internal trade to a very great extent. The accompanying map shows the distribution of markets. All the markets in the State are running under the authority of the Municipalities or the Revenue Department. There are 33 monthly markets, 49 weekly and 221 bi-weekly markets. There are also 35 cattle markets. It has been found practically impossible to evaluate the quantity of the produce that passes through each market. Not only do the kinds and quantities of things taken into the markets vary according to seasonal conditions and the supply and demand, but the same stock often moves from one market to another in the course of a week or month to such an extent that it is difficult to find out whether the quantity assembled in a

* For figures relating to the value of import of some of the articles of luxury see Appendix.

market is the produce of that locality. As different markets are sometimes held on different days, it is easy to expose the same things in more markets than one. The following table shows a taluk-war distribution of the markets.

Taluk-war distribution of markets.

Taluk.	Monthly.	Weekly.	Bi-weekly.	Total.
Thōvāla			1	1
Agasthīśwaram			4	4
Kalkulam		6	3	9
Vilavancōde		3	11	14
Neyyāttinkara		3	26	29
Trivandrum		1	2	3
Nedumangād			13	10
Chirayinkil		1	2	3
Quilon		1	3	4
Kunnathūr		2	12	14
Karunāgappally		6	3	9
Kārthigappally			2	2
Māvēlikara		1	7	8
Pathanamthittā	4	1	17	22
Thiruvalla	3		14	17
Ampalapula	...	...	...	...
Koṭṭārakara	2	1	21	24
Pathanāpuram	1	...	8	9
Shenkōṭṭa		2		2
Kōṭṭayam	1		12	13
Vaikom	1		6	7
Shērthala	...	...	...	....
N. Parur			6	6
Kunnathunād	2	2	13	17
Mūvāttupula		1	8	9
Thodupula			7	7
Minachil	1	3	17	21

Taluk.	Monthly.	Weekly.	Bi-weekly.	Total.
Changanāssery	4	3	12	19
Dēvikulam		4		4
Pirmāde		4	. .	4

Two hundred years ago labour was supplied by slaves or serfs attached to the soil. Muscle was cheap. Canter

Labour. Visscher mentions that the slave was a chattel bought and sold. Throughout the

Malabar Coast the practice of slavery had been encouraged by the Portuguese and the Dutch. It is stated that the latter used the church at Cochin to lodge the slaves without prejudice to the demands of divine service. Even so late as in 1812 Col. Munro, British Resident in Travancore and Cochin, discovered a number of half-starved and naked natives in irons as slaves at the Dutch settlement at Changanāssery. About 1850 the price of a slave was on the average between six and ten rupees.

In Travancore predial slavery was abolished in 1855. It marked an important step in improving labour. The Royal Proclamation said : " No public officer shall, in execution of any decree or order of court, or for the enforcement of any demand of rent or revenue, sell, or cause to be sold, any person, or the right to the compulsory labour or services of any person, on the ground that such person is in a state of slavery; that no rights, arising out of an alleged property in the person and services of any individual as a slave, shall be enforced by any civil or criminal court or magistrate within this territory; that no person, who may have acquired property by his own industry, or by the exercise of any art, calling, or profession, or by inheritance, assignment, gift or bequest shall be dispossessed of such property, or prevented from taking possession thereof, on the ground that such person, or the person from whom the property may have been derived, was a slave; that any act, which would be a penal offence, if done to a freeman,

shall be equally an offence if done to any person on the pretext of his being in a condition of slavery". For sometime later certain classes of people were forced to render compulsory service for the Government in the Department of Public Works and in collecting and removing timber from the forests. The practice was soon abolished. Dewan Mādhava Rao said: "No doubt many departments of the State have experienced some inconvenience; but a great act of justice to the poor has been carried out in earnest and much material and moral benefit has already arisen in consequence while the inconvenience experienced must soon disappear". A system of proper wages made labour more efficient by recognising freedom of contract.

To quote Rev. S. Mateer again, "Considerable activity in industrial and commercial pursuits, elementary arts and agriculture, prevails in Travancore so that a large proportion of the people are usefully occupied in various forms of productive labour. All the ordinary occupations essential to civilised life are carried on, often in a style very primitive and different from that of European workmen, but still practically efficient according to native ideas.*...The price of labour both skilled and unskilled and indeed of every commodity has largely increased within the last twelve years. Whether this is owing to enlarged intercourse with other parts of India, to the abolition of slavery and the spread of education and civilisation, to the emigration of many of the Shanars to Ceylon and the Mauritius, to the introduction of coffee planting, the building of bridges and other important public works which bring labour more into demand and consequently increase its value, or to other less obvious causes, producing a slow but general equalisation of the value of money throughout the world, it is not easy to say. But the wages of day labourers which in 1868 were,

* The Land of Charity, Rev. S. Mateer, p. 104.

in rural districts, 2 chuckrams a day have by degrees risen to a minimum of 5 chuckrams ($4\frac{1}{2}$ d.), while even more is paid to labourers on the coffee plantations. The price of rice, meat, cloth and other necessary articles have also doubled at least within the same period".

Skilled labourers are naturally on a comparatively better footing than unskilled labourers. The high rates prevalent in certain industries, e. g., motor repairs, are due to the insufficiency of skilled labourers. The working period in most of the industrial establishments is 8 hours a day and about 300 days in the year. There are some occupations in which work lasts throughout the year and for 9 to 10 hours a day. These, however, are exceptions.

"In ancient days wages were almost paid in kind. The Dēśavāli, for example, received yearly from the owners of gardens the produce of one plantain tree, ten coconuts, one jack, one chest of supari or betel nut". The wages of slaves and serfs were exceedingly low. Their allowance on work-days was double the proportion at other times, but it was never less than two pounds of rice to a male and about three quarters of that quantity to a female. The wages above mentioned were a third less than what was generally given to free men field-labourers who worked only till noon. The slave, on the other hand, had to toil from morn until evening and keep watch over the fields by night. But the self-interest of the owners gave an incentive to them to treat the slaves with kindness as understood at the time. This class of field-labourers were, however, regarded as chattels and sold with the land and delivered over in execution of decrees.

The operatives engaged in the organised industries number 99,579 and of these more than 71 per cent., i. e., 70,735 are employed in the cultivation of special crops. Of the various industries, coir and cashewnut factories

employ more than 23 per cent. of the operatives each, motor buses and lorries 12·6 per cent., tile and brick works 9·5 per cent., railways 5·3 per cent., printing presses 3·7 per cent., cotton weaving factories 3·2 per cent., and oil mills 2 per cent. The other industries employ 16·6 per cent. The plantations employ the largest number of labourers (men, women and children) but more men than women and the highest proportion of children to adults. The cashewnut factories employ mostly women, children forming almost one ninth of the adults and nearly 59 per cent. of the children being females. The proportions of women to men and of children to adults are considerably less in coir factories than in the plantations or cashewnut factories.

Agricultural wages are largely governed by custom. There is no organisation, no feeling of common interest among industrial labourers. They had a favourable time till recently with good wages and comparatively low prices of food stuffs. In Alleppey, according to the 1931 census, skilled male labourers used to earn from 12 as. to Rs. 1-4-0 per day, unskilled labourers 8 as. and skilled female labourers 6 to 12 as. The wages prevalent in important organised industries are shown in the following table as per the census of 1931.

Industry	Daily wages in chuckrams.	
Coir mat and matting factory	Men	21
	Women	12
	Boys	10½
	Girls	9½
Tile factory	Men	13
	Women	9
	Boys	9
Oil mills	Men	15½
Match factory	Men	14
	Boys	5¼
Monazite factory	Men	10½
	Boys	6¼

Industry.	Daily wages in chuckrams.	
Paper mills	Men	19
	Women	8½
	Boys	7
	Girls	5½
Printing works	Men	14½
	Boys	7
Motor repairs	Men	25
	Boys	13
Tea cultivation	Men	12½
	Women	9
	Boys	7
	Girls	7
Tea manufacture	Men	15½
Rubber cultivation	Men	10½
	Women	8¾
	Boys	7
	Girls	7

“Excepting Madras and the Central Provinces and Berar, Travancore has a higher proportion of agricultural labourers than any other Indian Province, evidently due even to the small cultivators here leaving the agricultural operations to the people”. Ward and Conner in their Memoir of the Survey of Travancore and Cochin observed:—“Wages are so trifling that even the poorest people found it more advantageous to labour on their own account for at least a portion of the year and there was an abundance of Sirkar land for cultivation. Three Idangalis of the unhusked rice and one meal was esteemed a fair hire for a day’s work; on an average eight hours, this would amount to about two rupees a month.” Agricultural labourers who receive their wages in kind are in a sad plight. In every place they are asking for wages to be paid in money

or for an increase in the quantity of paddy they usually receive as wages. In many parts of the country there is a slackness in the demand for agricultural labour and the tendency is for the wages to fall. The wages vary according to the sex and age of workers. There are also local variations in the wages as may be seen from the table in the Appendix. The average for all persons and all occupations generally is about $10\frac{1}{2}$ chuckrams or 6 as. per day.

Artisans, such as carpenters, goldsmiths, blacksmiths and other workers in cottage industries, are generally paid higher wages than field-labourers. The highest daily average wages are obtained by the goldsmith. The low rate of wages paid to potters is probably due to the fact that in many places they are given in kind, especially paddy, immediately after harvest, and its equivalent in money varies with the fluctuations in the price of paddy. The following table bears out the wages paid to some classes of workers.

Class of worker.	Daily wages in chuckrams.
Goldsmith.	18 $\frac{1}{2}$
Blacksmith.	15
Copper and Brass smith.	15 $\frac{3}{4}$
Carpenter.	16 $\frac{3}{4}$
Sawyer.	17
Mason.	18
Potter.	8
Tailor.	15
Washerman.	12 $\frac{1}{2}$

In the earlier days wages were determined by the caste of the labourer. The following table extracted from a document preserved in the Huzur Central Records shows the wages which were paid to the coolies employed in the construction of a Bhagavathi temple at Attingal in the year 927. *

* Ōla 219—224, Churūpa No. 1139.

Workers.	Units.	Total wages.
Carpenters.	2,056 thacchu.	1,799 fanams.
Elephant work. (213)	636 persons.	318 „
Masons.	1,435 persons	867½ „
Īlava coolies.	78 „	39 „
Mukkuvar.	54 „	18 „
Ūrālīs.	48 „	16 „
Blacksmiths.	10 „	5 „

“The problem of unemployment which was already very acute in the State was aggravated by the untoward economic situation. The disbandment of labour force on the rubber and tea estates is very considerable. Manufacturing firms have made appreciable reductions in the number of hands employed by them. Agriculturists either postpone or curtail, as far as possible, the employment of labour on their fields. The number of employees disbanded from commercial and industrial firms is not inconsiderable. Nor would it be correct to hold that unemployment exists only among unskilled labourers”. The number of the educated unemployed is steadily increasing. The Education Reforms Committee observed :— “Education in itself is not responsible for unemployment. There are a large number of basic conditions not directly connected with education which are responsible for unemployment. The ability of the country suitably and profitably to absorb its educated men and women into the organised professions, industrial and agricultural life of the country naturally depends mainly on the economic conditions prevailing in the country. Persons leaving educational

institutions, of whatever grade, are finding it increasingly difficult to secure suitable employment. The incidence of unemployment is largest and most difficult to deal with at the English School Final and Vernacular School Leaving stages."

The general economic depression is one of the foremost causes of unemployment. Agricultural, industrial and professional occupations have all been largely affected by the prevailing fall in agricultural prices, the contraction of trade and the general retrenchment consequent on depression. "There are certain other causes also for the increase in unemployment. One such is the adherence to traditional occupations and the inability or unwillingness of educated persons to enter new occupations when the old ones have ceased to be profitable. The continued desire of educated young men, for example, to enter government service or the professions is not only causing unemployment, but is indicative of a lack of self-reliance and private enterprise, which apparently prevents many young men from being apprenticed to industry and business."

The services of a large number of men, possessing educational qualifications, employed as clerks, accountants, supervisors and in various other capacities have also been dispensed with. Further, a large number of Travancoreans who were employed in Burma, Malaya, the Straits Settlements, Ceylon and other countries, have been turned out of their jobs and have come home to swell the ranks of the unemployed. The rapid growth of the population which has strained to the utmost the resources of agriculture, the prime occupation of the people, has contributed in a large measure to the number of the unemployed. "Leaving aside children below 15 years, all women engaged in house-keeping, all boys and girls at school or college, it is seen that roughly 179,000 males and 321,000 females or in all 500,000 persons of 15 years and over are entirely unemployed, of whom 152,000 are literate and 348,000 illiterate."

The food production of the State is inadequate to its needs. When part of the food supply has to be obtained by purchase, the level of prices becomes an important factor in determining the economic condition. In these circumstances, the economic condition of this primarily agricultural State could not but be affected by the general economic depression. The movement of prices here, as in the rest of India, is bound up with the movement of prices throughout the world. "The worst feature of depression from the point of view of Travancore, as of India, is that the fall in prices was much more marked in the case of agricultural than in that of manufactured products. The prices of the staple articles of local production, such as, paddy, pepper, coconut, rubber and tapioca, have fallen abnormally. Taking the general trend of the prices of agricultural products, we find that prices have in a decade fallen by 60 per cent. The year 1110 (1934-35), however, witnessed a rise in the prices of all kinds of products; but this rise was to a large extent due to diminished yield resulting from the failure of rains. What the vast majority of the people stand in need of is better prices for the products. Broadly speaking, all classes of people are affected by the prevailing depression, directly or indirectly. Some classes have been affected more severely than others. The fundamental cause of the trouble being the collapse of commodity prices, the blow has directly fallen on those classes whose income depends entirely on the saleable surplus of their agricultural produce. The economic stress is acutely felt by the middle class of people. The depression has rudely disturbed the even tenor of their placid existence. Many industries which were thriving recently are passing through distressing times. Determined efforts have been made to alleviate the economic distress."*

* Economic Depression Enquiry Committee Report, pp. 10-17. .

Regarding the economic position of the agriculturists, Mr. Nāgam Aiya wrote in 1904 :— “The comparative immunity from famines does not however

Indebtedness. mean that the Travancore ryot is in a state of affluence. On the contrary every ryot, nine out of ten of them, has always some debt standing against him, owing to a variety of causes”. ... “But it is certain that no material ryot population in Travancore can be said to be in a state of what would be called ruinous indebtedness, nor are there cases of ryots owning land having gone down to the lower order of the agricultural labourers, as seems to be the case in some of the British districts. It is, however, a well recognised fact that there are not many rich ryots in the sense of having a super-abundance of wealth and influence as there are merchant princes here and elsewhere among Sindhikār, Kōmatṭies and Nāṭṭukkōṭṭai Chetṭies wielding immense power over states. Agriculture even under the most favourable conditions never raises a man to this high pitch of prosperity nor does it bring him down suddenly to the depths of poverty or bankruptcy”. In recent years the agriculturists have been getting more and more into debt.

Agricultural indebtedness is a serious question in many countries. Sir Frederick Nicholson estimated the total debt of the rural population in the Madras Presidency in 1895 at 45 crores of rupees. The Indian Famine Commission of 1901 found that at least one-fourth of the cultivators of the Bombay Presidency had lost possession of their lands, that less than a fifth were free from debt, and that the remainder were indebted to a greater or less extent. In the Punjab, according to a recent estimate, the total average debt of the large proprietors is seven times the land revenue paid by them, and of the smaller proprietors, owning or cultivating less than 8 acres, 28 times the land revenue; the aggregate indebtedness in the province comes to about 30 millions sterling. According to the Economic Census of

1931, the total indebtedness in Travancore comes to about Rs. 20 crores.

The plight of the agriculturists in Travancore is thus described by the Agricultural Debt Redemption Committee. "The decade that followed the war was marked by the high prices of our agricultural products and the consequent rise in the value of agricultural land. These, in their turn, increased the credit of the agriculturists and their borrowing capacity and those who had money to lend were generally inclined to lend as freely as the agriculturists were prepared to borrow. A portion of the loans thus raised was no doubt utilised for domestic and social expenses, such as marriages, education of children, etc. But there can be no doubt that a very considerable proportion of the loans are invested on the purchase and improvement of land. Over and above such direct borrowing, money was also raised by bidding chitties. Towards all these debts, land, both previously owned and newly acquired, was extensively hypothecated. It satisfied both parties as long as high prices ruled the market, and, if economic conditions had remained what they were, the present situation might not have arisen, as ordinarily the agriculturist would have been in a position to meet his expenses and discharge his obligations, at any rate to a considerable extent, from the income of his agricultural holdings. But then, the depression set in, bringing with it a sharp fall in the prices of coconut, paddy and rubber and all other products of agriculture. Consequently, the cultivator's assets underwent a rapid depreciation and the yield of his land ceased to give any adequate margin to admit of repayment of debts. The weight of debt became heavier and heavier day by day, and the repayment of debts and even the payment of interest became irregular." They proceed to say: "There is a tendency in certain quarters to hold the agriculturist entirely responsible for the plight in which he finds himself at the present day. We do not think that it is just to ascribe the whole

situation to the extravagance, improvidence, speculative dealings and unproductive borrowings of the agriculturists. It may be admitted that most agriculturists in this country have a great partiality for investments in land and sometimes they purchase land not for its economic value, but at fancy prices. We are, however, inclined to the view that the agriculturists no more deserve these charges than the other classes in the country. We find that in this view we are supported by the Banking Enquiry Committee who have recorded their considered opinion that the agriculturists of Travancore are not extravagant, as a rule.* In spite of all his faults, either real or imputed, it has to be admitted that the agriculturist has, generally speaking, got a high sense of honour and personal integrity. In normal times he had been, generally speaking, keeping up engagements and meeting liabilities. Nor have we observed anywhere, even under the present severe strain, any general tendency or inclination towards wilful evasion of payments or repudiation of debts. We believe that, over-topping all considerations relevant to the present situation, stands the fact that the depression has descended on the agriculturists with unexpected suddenness and severity and that they have to suffer on account of forces beyond their control.

“The results of all previous investigations have shown that agriculture, particularly the cultivation of paddy, leaves very little margin of profit to the cultivator even in normal times. In recent years, the agriculturists have had to face floods and droughts in succession and the consequent failure of crops side by side with declining prices. These circumstances also have contributed to their present plight.

“The artificial rise in the standard of comfort increased the expenditure in the household. All classes of the people, including the poorest, felt obliged to expend

* Vide paragraph 63, the Banking Enquiry Committee Report.

moneys for the education of their children. In many cases the total amount of school fees made serious inroads in domestic economy. The amenities of civilised life had their own fascination for the poorer classes as well as for their more fortunate neighbours. The result was that borrowing became the favourite device for obtaining the money which was so needed".

Agricultural indebtedness is decidedly on the increase. In 1079 M. E. (1903-04) the Settlement Dewan Peishkar estimated the extent of indebtedness during that year at Rs. 2.40 crores. But the Banking Enquiry Committee conducted an exhaustive investigation, including an intensive survey of 13 typical villages in the State, and they have placed the total rural debt of the State at about Rs. 25 crores. According to the Economic Census of 1931, the total debt comes to Rs. 20 crores and the average *per capita* debt to about Rs. 40. But the Economic Depression Enquiry Committee and the Agricultural Debt Redemption Committee proceeded on the assumption that the volume of indebtedness lies between the two estimates referred to above, i.e., between Rs. 20 crores and Rs. 25 crores. Of this debt about 69.5 per cent. is secured on land, 26.6 per cent. being mortgages with possession. It is seen that there is a close correlation between debt and prosperity. The average debt is the highest among the Brahmans and the least among the backward communities. Considering the total debts in the various taluks, without reference to the omissions that may exist, it is seen that the average debt per earner is the highest in Minachil, viz., Rs. 283. On the demand of the people through the Legislature and the Press, and as a result of the recommendations of the Economic Depression Committee, relief was granted by the Government in the form of reduction or remission of taxes, suspension of coercive proceedings, extension of the period for the payment, reduction in the rate of interest on government loans, etc.

Among the other reliefs granted were reduction in the tariff value of coconut products, remission of a portion of the land tax, reduction in the rates of school fees, reduction in the rate of interest on loans issued by the Government for agricultural purposes, raising the maximum in the case of loans issued by the State Land Mortgage Bank, etc. These have not, it was alleged, and alleged with justice, substantially contributed to the solution of the problem of agricultural indebtedness. The Government accordingly considered ways and means to tackle the problem in other directions. A conference was held at Bhakthivilās, on the 13th December 1934, under the presidency of the Dewan, to consider the above scheme. There was a full discussion of the various aspects of agricultural indebtedness. The conference recognised the need for a thorough investigation and the collection of more detailed information, especially statistical.

Relief to agri-
culturists.

The Government also resolved to refer the whole question to a committee of officials and non-officials. The Agricultural Debt Redemption Committee was thus appointed in 1935 to collect data, investigate the extent of agricultural indebtedness and examine the various proposals contained in the non-official schemes submitted to Government and also the methods adopted towards the relief of agricultural indebtedness in the various British Indian Provinces and other Indian States, and to suggest such measures of relief as could be given effect to in this State. The Committee found that while the debts were on the increase the sources of credit were inadequate to meet altered requirements. The situation was so bad that even the creditors were found to be willing to settle the debts by negotiation, allowing substantial reduction in book debts, provided, payments were made in cash. The bankers desired that when settlements were made the payment should be made in lump. After considering the arguments on both sides the Committee found that relief measures were as urgent as they

were indispensable. As regards the exceptional treatment recommended, the Committee made the following justification:—

“In an agricultural country like Travancore, it is the agriculturist who provides employment and the main source of wealth to the rest of the population and he is the principal contributor to the resources of the State. His contentment and prosperity as well as the improvement of his buying power and standard of living will redound to the prosperity of all the trades and professions. The agriculturist has, therefore, the predominant claim for relief. At the present time he finds himself severely hit. The value of his produce has fallen much more heavily than that of the manufactured goods that he has to buy. The abnormal depreciation in land values has disrupted his credit. The real burden of his debts has increased very much in terms of his produce and, unless in the midst of the present unforeseen and wide-spread calamity he is offered substantial relief, he stands to lose his land which is the main-stay of his life.

“The main source of our wealth is the value derived from agricultural produce directly exported or exchanged for the products of other countries. To rehabilitate the agriculturists is, therefore, to supply the channels of distribution and credit with the funds which they would otherwise lack. The way out of the present *impasse* is, therefore, to encourage the agriculturist to keep on to his land in the hope of better times, both for his own sake and for the sake of all other lines of business.

“We are, therefore, of opinion that agriculture being the key industry and the basis of the wealth of the country, and the agriculturist being very severely hit, his relief calls, on public grounds, for greater consideration at the hands of Government, than that of any other class of debtors”.

The Report of the Committee was considered by both the Houses of the Legislature. Meanwhile, a deputation of bankers, merchants and jenmies waited on the Dewan and represented that the bill, if passed, would adversely affect their interests. The Dewan in reply said:—

“Government will not shirk the task of examining the bill most carefully with a view to the reconciliation of the various interests concerned. Government are particularly anxious that the agriculturist should not feel that the burden is so heavy upon him that there is no incentive to toil and no stimulus to redemption. It would be an evil day when the small agriculturist feels that his future is so dismal and dark that it is hardly worth his while to toil in the field, that his burden of debt is so terrible and crushing that, without its being lifted to a certain extent, his self-respect will not be restored and his incentive to work will not come back to him. The Government’s elementary duty is to step in and help him. This is the modern policy so different from the policy of *Laissez faire*. The governments of the world are now trying to enter into the life of the people and to organise and to regiment their transactions. Therefore, my first remark, which I hope you will take in the spirit in which I put it before you, is that agriculturists—deserving agriculturists—whose burden of debt is so crushing that debt deprives them of all stimulus to agricultural activities, will have to be helped”.

It was found that there was a consensus of opinion in favour of legislation to alleviate the distress. The bill introduced by the Government was considered by a strong select committee appointed by the Assembly and was passed by the Śrī Mūlam Assembly and the Śrī Chī’hīra State Council with slight modifications. It secured His Highness’s assent and became law as Regulation III of 1112. While the Regulation seeks to give relief to the agriculturist debtor, it does not seriously prejudice the rights of the creditor, and vested private rights are not sought to be interfered with

in any substantial manner. It aims at strictly limiting the arrest of agriculturists in execution of decrees, the practical effect being that the agriculturist who is really unable to pay his debt will be free from arrest if his conduct has been quite straight and honest.

Debt Conciliation Boards have been established in certain centres. They are invested with authority to hear the claims of both the debtors and the creditors and pass awards reducing interest, allowing payment by instalments, and even scaling down the debts in appropriate cases. The laws enable them to take into consideration all the surrounding circumstances including the conduct of the parties. The jurisdiction of the conciliation officer rests upon the agreements of both parties. The courts are also empowered to give appropriate relief against orders passed by the officer in cases in which the orders are against law and the principles of natural justice. Some of the Conciliation Boards have done fairly good work. But substantial relief has not been forthcoming either to the debtor or to the creditor. The creditors are often willing to give a complete discharge in case the debts are paid in bulk in cash. Generally, the debtors are prepared to do so but they lack cash, and the existing credit institutions are unable to help them.

There are banking institutions throughout the State. Some of them have branches outside the State as well. The

Banks. principal agencies which finance trade, agriculture and industries are the money lenders, joint stock banks, co-operative societies, chitties and the Government. The growth of joint stock banks in the State had been rapid till 1106 but since then there is a gradual fall, as is evident from the following table:—

Year.	No. of banks registered in each year.	No. of banks at work at the end of each year.
1102	14	56
1103	66	119

Year.	No. of banks registered in each year.	No. of banks at work at the end of each year.
1104	74	194
1105	63	255
1106	18	269
1107	9	267
1108	8	274
1109	8	266
1110	2	251
1111	8	245
1112	7+1 (Nidhi)	243

The table on the next page shows the nature of the joint stock companies working in the State. The economic depression gave a set-back to the registration of new banks. 243 banks were conducting banking business at the close of the year 1112. Several banks entered on liquidation during the last ten years. With the object of attracting deposits most of the banks conduct chitties soon after their registration.

The agricultural and industrial loans issued by the Government reach only a small section of the agriculturists.

The bulk of the agricultural credit is
Loans. supplied by rural money lenders. The

joint stock banks used to lend to well-to-do agriculturists mostly on personal security, but to some extent also on the security of land. After the depression began to take a serious turn, their dealings with the agriculturists have decreased and fresh loans are not generally advanced. The co-operative societies render considerable assistance to the smaller agriculturists in particular by advancing small loans at prescribed rates of interest which cannot be said to be low. It is seen that the borrowers do not generally abide by the conditions of repayment and finally have to pay rates even

Table showing the number of joint stock companies from 1102.

Year	1		2		3		4		5		6		7		8		9	
	Banking, Loan & Insurance		Transit and transport		Trading and manufaturing		Mills and presses		Tea and other planting companies		Sugar including jaggery and manu- facture		Hotels, theatres and other entertain- ments		Companies limited by guarantee		Other companies.	
	Banking and loan	Nidhis Insurance																
1102	56	1	0	5	40	5	44	1	1	3	1	1	1	1	1	1	3	3
1103	119	1	0	5	48	3	43	1	1	3	1	1	1	1	1	1	3	3
1104	194	1	0	6	54	3	47	1	1	3	1	1	1	1	6	1	1	1
1105	255	1	1	7	62	4	37	1	1	3	1	1	3	3	9	1	1	1
1106	269	1	13	7	65	4	37	1	1	3	1	1	5	5	11	1	1	1
1107	267	1	261	9	65	5	37	1	1	3	1	1	6	6	19	1	1	1
1108	274	1	509	10	78	6	38	1	1	3	1	1	6	6	19	1	1	1
1109	266	1	239	9	64	6	35	1	1	3	1	1	6	6	18	1	1	1
1110	251	1	46	8	70	4	39	1	1	3	1	1	3	3	21	2	2	2
1111	230	1	22	6	56	4	36	1	1	3	1	1	3	3	21	3	3	3
1112	237	2	22	10	84	5	57	1	1	3	1	1	3	3	21	3	3	3

higher than those ordinarily charged by money lenders. As regards chitties, the ordinary half-yearly ones have all practically come to a stand-still. At present the chitties have ceased to be a source of agricultural credit. Further, there is a wide-spread feeling that this system of raising loans has been ruinous to the agriculturists. These credit institutions which were long functioning do not at present play any substantial part in the trade of the country. Nor are the hundi merchants able to carry on lending at the old rates of interest. The joint stock banks are displacing the old forms of credit. The rates of interest used to be charged actually amounted to 18 per cent. per annum and at times even more. The interest on Government Land Improvement and Agricultural Loans has been reduced from 6 to 4 per cent. from the beginning of 1110 (1934-35). The co-operative societies lend at 10 per cent. but including penal interest the rates go up to 16 per cent. The bank rates show a general decline, but still vary between 12 and 15 per cent. Some joint stock banks and private banks still charge *vattom* and commission, which raise the actual interest as high as 24 per cent. and also realise compound interest by regular periodical renewals. The rates of interest prevailing in Nānjanād are according to all accounts the highest in the State. The smaller agriculturists there have sometimes to pay more than 50 per cent. on the loans advanced by petty money lenders. The interest on paddy loans varies between 10 and 20 per cent. though in special cases there is a tendency towards lower rates in Kuṭṭanād.

Trade and industry are still suffering from want of adequate financial help. There is very little possibility of agricultural and industrial expansion unless the credit system is organised and utilised for the best interests of the the State. A central banking institution in Travancore, which will co-operate with the existing banking agencies and reinforce credit in the State, will actively stimulate industrial development and extend internal and external trade. It

is with this idea that the Travancore Credit Bank has been established. The Government has invested considerable sums in the institution.

The total number of persons returned as having money investments is 226,279, which is but 16·7 per cent of the total number of earners. The investments may not have been included in the returns. The total volume of investments, according to the Economic Census, was Rs. 1,068 lakhs, giving an average of Rs. 472 per investor and Rs. 79 per earner. A margin of error of 3 per cent. may, however, be allowed.

“Rural revival with its immense economic and sociological advantages is of great importance to the nation and indicates the most promising way of escape from our national economic dislocation and our spiritual degradation”. It is indeed an essential factor in any policy of national reconstruction. The slogan of rural reconstruction being so insistently heard, there has been a general awakening among the social workers of Travancore. The rapid progress made in the field of rural reconstruction has attracted many a distant observer to the State. Speaking at Kandy His Excellency the Governor of Ceylon said: “I can wish nothing better for Ceylon and her peoples than that she follow the successful work (in rural reconstruction) being carried on in Travancore”. Rural welfare has always engaged the earnest attention of the Travancore Government and several steps conducive to rural amenities have been taken through the development departments of the State. Rural reconstruction activities are carried on mainly through co-operative institutions and by the adoption of co-operative methods. The Y. M. C. A. is carrying on an intensive programme of rural reconstruction at Marthandam, which occupies an area within 5 miles radius of that place. Now

it is one of the recognised centres of All-India importance. A survey of the village was conducted and it was found that efforts should be made to improve the social, educational, spiritual and economic conditions of the people. With a view to improving the economic condition of the people the Association introduced supplementary industries as poultry-farming, bee-keeping, cattle-breeding, preparation of cashewnuts, cleansing of jaggery and tamarind, etc. Rural exhibitions are held to demonstrate the activities of the area both at the centre and in each village. What the Y. M. C. A. has been demonstrating and teaching in the Mārthāndam Rural Reconstruction Centre has been copied elsewhere. The Association has tried to include the broader, comprehensive five-fold programme, spiritual, mental, physical, social and economic.

Some co-operative societies have established rural reconstruction centres of their own. Two societies, one at Thoḷukkal in Neyyāttinkara taluk and the other at Uḷḷannūr near Panthalam, have been started. The Thoḷukkal society has been receiving substantial assistance from the Department of Industries in the encouragement of pottery manufacture and from the Department of Public Health in the matter of improving the sanitation of the village. The society at Uḷḷannūr has a rural reconstruction school. "It has 6 acres of land and 12 teachers who are far above the educational standard usual in rural schools and who act as extension workers towards the economic improvement of the whole country. The school acts as a community centre for all castes and creeds who are co-operating in the raising of the area to a higher level. An impetus was given to co-operative rural uplift work last year by the appointment of a Rural Reconstruction Central Committee at the north divisional co-operative conference. A committee of co-operators was formed in the northern taluks. This committee has conducted preliminary surveys of select villages on an extensive basis, and on the results of the

surveys, opened rural reconstruction centres. Societies like the Eṛāḷa Co-operative Society, Ltd., and the Vaḷuvaḍi Christian Co-operative Society near Māvelikāra deserve mention in this connection. The Neyyūr Co-operative Society is conducting schools, improving rural communication and increasing the productive capacity of the villagers, and their enterprise is very admirable and encouraging.

Recently the Government have taken steps to try and initiate a system of broadcast, "the idea being that in select localities, both urban and rural, there should be a chance of hearing good music, listening to good lectures of select men who are experts in their special subjects, and it will try to inculcate lessons, industrial, agricultural, manufacturing, and also give that patriotic bias and that love of the country to the people which is already seen in an abundant measure here."

Reports of rural reconstruction activities have created in the minds of the villagers a desire for better living. The best way in which Travancore is giving aid to the rural reconstruction movement is through the training of teachers. Since 1926, nearly 900 "leaders" have been trained in the practical training school of rural reconstruction at Mārthāṇḍam and they have succeeded in putting into practice what they have learnt in the villages around Mārthāṇḍam. The people of other parts of this country and even foreign countries are looking to Travancore for guidance.

As an instance of good result may be mentioned the extension of the market for eggs. Travancore is now exporting large quantities of eggs. The following table bears out this fact.

Year.	No. of eggs exported.
1106	1,10,90,000
1107	1,53,85,000
1108	1,36,03,000
1109	1,48,16,000

Year	No. of eggs exported.
1110	1,58,00,000
1111	2,03,96,000
1112	1,50,55,000
1113	2,03,97,000

The value of eggs exported in 1113 amounts to Rs. 3,89,128. This, however, is but a very small fraction of the price of the total number of eggs produced.

The total private income per annum, according to the census of 1931, is Rs. 20·9 crores and, if allowance is made for an error of 25 per cent., the total income will amount to Rs. 26 crores and the *per capita* income will then be Rs. 51. This calculation is based on the prices current in the year 1931 when the economic depression practically reached its lowest depth, causing a decline of not less than 40 per cent. generally in the prices of commodities. Wages had also fallen though not to the same extent. There was an all-round shrinkage in the income of agriculturists, industrialists, traders and other businessmen. If normal conditions had prevailed, the *per capita* income would have been Rs. 85. The distribution of income among the earners is not as unequal as that of capital. Of the different communities it is seen that the Brahmans, the Syrian Christians and the Muslims have high income, while the backward Hindus occupy an intermediate position. The subjoined table shows the sources of income:—

Item of income.	Income in lakhs of rupees.
Rent from land.	117·1
Net income from cultivation.	713·1
Income from other occupations.	1,167·8 *
Interest on investments.	. 91·9
Total.	2,089·9

- * Includes agricultural labourers also.

The proportion of earners following occupations other than agriculture is least among the Nāyars. Of the divisions and taluks, places having more wealth generally have higher incomes with one or two exceptions caused by the purchasing power in the vicinity of towns. The income from different classes of occupations, as per the Economic Census of 1931, for the State and urban areas is given in the table on the next page.

Occupation.	No. of persons following occupation.	Total income in lakhs of rupees.	Average income per head in the State. Rs.	Average income per head in urban area. Rs.
Agricultural labour	2,63,385	160.9	61	84
Estate coolies	46,128	54.8	119	...
Unskilled labourers	87,155	70.1	80	167
Fishing	29,597	38.5	130	140
Fish trade	14,725	18.7	127	195
Exploitation of minerals	2,056	2.9	141	...
Textile industry	88,132	78.2	89	248
Wood industry	41,145	43.9	107	164
Metal industry	11,514	17.4	151	189
Ceramics	5,353	8.6	161	248
Other industries	55,515	74.4	134	208
Transport	32,742	49.7	152	260
Trade .	120,293	235.4	196	357
Public Administration	17,710	58.8	332	440
Professions & liberal arts	56,465	139.4	247	353
Miscellaneous occupations	43,751	86.8	198	256

Private income or the income of individuals, as it was in 1931, stood at Rs. 51 per head. National income represents the total production of commodities in the country in a year, which in 1931 amounted to Rs. 2,241 lakhs. This would give a national income of Rs. 44 per head.

If the production of wealth has increased, the consumption of utilities has also developed to a considerable extent.

The old order of contented ease has disappeared. The necessities and comforts of life have multiplied. Houses built of wood have given place to those of stone and lime; the brass lamp and the coconut oil have yielded to the foreign nickel lights and kerosene oil, while some of the important towns are supplied with electric lights. The farmer who used to be contented with a thōrthu reaching to the knee is now hankering after fashion and clothes manufactured in Manchester or Japan and a shirt have become indispensable. The thirst for luxuries has so much increased that unnecessary expenditure is incurred on them and necessities are put off. These forces are working with accelerated momentum. Cold rice which was the morning meal of even the middle classes thirty or forty years ago finds a substitute in tea, coffee or cocoa. The labourer patronises the tea shops with stern resolve. In the old days a bowl of buttermilk largely diluted with water was a valued repast, which the wealthy freely offered in thannirpanthals distributed throughout the country. At present aerated waters have secured an expensive popularity. Silk sarees, homespun tweed, soaps and other articles for the toilet, biscuits and other prepared food and delicacies like fruit jam and foreign made cakes are greatly relished.

For a proper estimate of consumption it is necessary to have reliable statistics of production, imports and exports. In the absence of such figures the statistics of imports form the only data to arrive at the figures as to consumption. The following tables give the important articles of import, the places whence they are imported and an estimate of family expenditure respectively.

Goods imported.

Serial No.	Description of articles.	Unit.	Quantity.		Value in Bh. Rs.		Percentage on the total value of imports of merchandise.	
			1112	1113	1112	1113	1112	1113
1	Cashewnuts	Cwts.	5,79,990	3,70,420	37,42,805	20,90,903	5.0	2.8
2	Hardware	Cwts.	...	...	10,71,911	9,41,470	1.4	1.2
3	Kerosene	Gls.	70,71,826	80,41,266	51,03,262	52,78,102	6.9	7.0
4	Liquors	Gls.	...	...	4,22,382	3,07,457	0.6	0.4
5	Machinery	...	...	...	6,09,666	12,19,480	0.8	1.6
6	Metals and ores	...	...	...	11,32,039	25,22,692	1.5	3.3
7	Paddy	Cwts.	4,71,128	5,68,763	13,86,910	16,77,769	1.9	2.2
8	Petrol	Gls.	30,00,956	26,58,030	37,39,650	36,02,002	5.0	4.8
9	Provisions	...	...	...	6,29,020	4,58,398	0.8	0.6
10	Rice	Cwts.	51,64,193	59,66,193	2,18,57,704	2,40,79,308	29.5	31.9
11	Spices	...	...	...	22,83,010	81,00,144	3.1	2.8
12	Textiles	...	...	...	79,45,995	82,69,699	10.7	11.0
13	Tobacco	...	...	...	49,40,474	27,90,426	6.7	3.7
14	All other articles	...	...	...	1,93,69,513	2,00,78,787	26.1	26.7
Total					7,42,39,341	7,54,16,537	100.0	100.0

Countries whence imports come.

Serial No.	Name of country.	Value	Percentage on the total import of merchandise.
		Bh. Rs.	
1	British India	2,27,49,893	30.17
2	Cochin	11,06,996	1.47
3	Hyderabad	2,80,425	0.37
4	United Kingdom	82,96,585	11.01
5	Burma	3,35,88,157	44.54
6	Ceylon	8,29,544	1.09
7	Finland	2,18,423	0.29
8	Germany	8,01,331	1.06
9	Belgium	2,39,678	0.32
10	Italy	1,55,417	0.21
11	Java	10,34,210	1.37
12	Japan	28,57,161	3.79
13	Portuguese East Africa	14,08,595	1.87
14	United States of America	13,96,714	1.85
15	Other countries	4,53,408	0.59
Total		7,54,16,537	100.00

·Estimate of expenditure for a family of five persons (Banking Enquiry Committee).

Items of expenditure.	Family of 5 in comfort. Rs.	Percentage to total.	Family of 5 in indigence. Rs.	Percentage to total.
Food.	150	36.1	104	72.2
Dress.	20	4.8	8	5.6
Cost of cultivation.	80	19.3	3	2.1
Cost of journeys.	12	2.9	2	1.4
Litigation.	12	2.9	...	...
Interest on loans.	36	8.7	8	5.5
Payment for charities.	60	14.5	...	...
Ceremonies.	10	2.4	...	...
Lighting.	10	2.4	3	2.1
Education.	10	2.4	...	..
Medical expense.	6	1.5	...	...
Drink.	...	...	13	9.0
Tobacco & other luxuries.	9	2.1	3	2.1
	415		144	

Travancore is generally free from famines. But they are not altogether unknown. The year 1036 M.E. was one of exceptional scarcity. It is referred to in the Administration Report for the year in these terms. "There was much distress in consequence of the failure of crops. The price of food rose higher than ever known before and thousands of men, women and children had no resource but charity to look to for bare existence. The Sirkar was not wanting in exertions to mitigate this distress as far as it lay in its power. Food was given gratuitously to the poor in several localities as also cloths, small sums of money and other similar aids. Such as were able contributed largely to the relief. And it is only right to notice here with every prominence the liberality of England at this juncture. The British Government kindly granted the request of the Sirkar to suspend the duty on the exports of grain and rice to Travancore from British territory and this concession in conjunction with a similar removal of import duty on the part of the Sirkar contributed to the influx into the country of a large quantity of food. Paddy to the cost of Rs. 50,000 was gratuitously given to the poor. About Rs. 12,000 worth of rice was purchased by the Sirkar at Mangalore and brought down here and re-sold to the poor at rates advantageous to them. Grain and rice to the value of Rs. 12,00,000 was imported into Travancore from abroad."

In spite of the efforts made by the Government to store water for agricultural purposes failure of rains cause great hardships. The year 1110 was one of severe drought throughout the State. Both the monsoons were indifferent. "The north east monsoon practically stopped by the end of October and was followed by a period of seven months with little or no rain in almost all parts of the State. The south west monsoon appeared at the proper time, but the precipitation was nowhere strong till the end of the year. The prolonged drought adversely affected all the crops. Paddy failed

in all the seasons. With a view to mitigate the hardships of the ryots on account of the poor yield of harvests and the economic depression, remission to the extent of $18\frac{3}{4}$ per cent. of the land tax, on all āyacuṭ wet lands and tank-bed conversions in the taluks of Thōvāḷa and Agasthīswaram and on post-settlement kāyal reclamations in the taluks of Ampalappula, Changanāssēry and Kōṭṭayam was granted. A remission of $12\frac{1}{2}$ per cent. of the land tax, excepting water rate, on all other lands, wet or dry, including Kaṇḍukrishi and Śrīpandāravaka lands, but excluding lands cultivated with tea, rubber, cardamoms or coffee, was also granted. Over and above this general concession, the remission of tax for the Kumbham crop was raised to 50 per cent. in the Thōvāḷa and Agasthīswaram taluks and made applicable to water cess as well, and a complete remission of water cess on the Kumbham crop was granted where there was complete failure of crop. The general concession allowed in respect of lands cultivated with rubber was extended to chērikal lands as well. Further, extension of time for the payment of tax for 1110 was allowed till the last day of Kanni 1111".*

While droughts frequently occur in South Travancore, floods cause great havoc in the north. Failure and destruction of cultivation due to these have obliged the Government to make frequent remission of taxes. The floods of 1057 and 1099 were of exceptional severity. About the former the following is the observation made in the Administration Report of 1057 M. E. "The unprecedentedly heavy rains in the north resulted in destructive floods which caused much damage to property and some loss of life. Whole villages were in some places submerged and the country to the north of Quilon was for several days one sheet water. This necessarily caused great distress among the poorer classes of the population". For several decades after

* Travancore Administration Report for the year 1110.

1057 there had been no such wholesale devastation by floods as in that year. But the floods of 1099 proved equally if not more disastrous. Of that it is recorded that "the unprecedentedly heavy rain that fell towards the close of the south west monsoon resulted in unusual floods in all the rivers of North and Central Travancore. There were heavy slips and landslides in the plain districts. The taluk of Parūr and the low-lying lands of Kuttanād sustained the heaviest damage. Portions of other taluks were also seriously affected by the floods, habitations, public buildings, communications and crops alike suffered. The Kanni crop was practically lost and the seedlings for the Kumbham crop damaged in most cases. There was considerable loss of cattle, but human mortality was on the whole small. To relieve the sufferings of the people, Government gave immediate gratuitous relief to the extent of about half a lakh of rupees in the shape of distribution of food, clothing, rice and money in all affected areas..... Building materials, such as bamboos, grass and reeds, were arranged to be distributed by the Forest Department from convenient centres in the affected localities, free of cost, to poor ryots, and at cost price to bonafide purchasers from the better classes. Drift jungle wood and other timber were also sold at cheap rates to the public. A sum of Rs. 5,50,000 was set apart for distribution as loans for reconstruction and reclamation..... A general Flood Relief Committee was organised to co-ordinate the relief work done by the Government and the local committees. They have been able to collect over Rs. 60,000 and distribute most of the collections in the shape of free grants to the poorest among the sufferers to enable them to reconstruct their huts and to rehabilitate themselves in others ways."

The endeavours made to increase the production and facilitate distribution of wealth have been steady. In order to co-ordinate the activities of the several development departments and to secure

non-official advice in the development of the economic resources of the State, the Economic Development Board was constituted. The Board was reorganised from the beginning of 1108 and again remodelled in Chingam 1113. The object of the Government in reorganising the Board was to make it a really representative organisation. The Board is composed of thirty members, ten officials and twenty non-officials. The Government has agreed to give the best consideration to the suggestions of the Board and not to initiate any new economic policy without consulting them

His Highness the present Mahārāja takes a deep personal interest in economic reconstruction. His constant

Conclusion. desire is to further all well-considered measures for the good of his people. In

the course of the speech at the Investiture His Highness said: "It is my hope that I shall be enabled by God's grace to earn the affection and esteem of all communities and classes amongst my people whose advancement in every department of life will be my perpetual pre-occupation and my sole aim. It is a very great trust that has been transmitted to me and I realise that that trust will not be well discharged except to the extent that I am able to promote the peace, contentment and prosperity of my subjects." On this occasion His Highness announced a gift from the Privy Purse of a sum of one lakh of rupees for a Travancore State Land Mortgage Bank and another sum of half a lakh of rupees for starting a home for the destitute and infirm. With the object of reducing mendicancy and distress by methods of organised relief, the Śrī Chiṭhira Home for the Destitute and the Infirm was inaugurated under the auspices of His Highness the Mahārāja's birthday in 1934.

. "What the object of Government should be is to show to the people possibilities of industries and trade, to give them demonstrations, to start model factories, and

after the people have learnt to stand on their own legs, to step aside leaving it to the people to develop them as real national assets." This is in consonance with the policy of all enlightened states.

"Individualism and collectivism are indeed but two ways of looking at the same thing—both necessary, and each the complement of the other. The antagonism between them is the result of looking at half the picture at once. The rights of the individuals and the community exist side by side, and it is one of the principal functions of government to arrange their harmonious correlation. The individual is entitled to a reward for his own productive effort. The community is entitled to receive the benefit of the co-operative aspect of that effort. In politics the problem is that of the distribution of wealth with justice at once to the individual and the community.†

* Speech delivered by Dewan Sachivōthama Sir C. P. Rāmaswāmī Aiyar, after laying the corner-stone for Sir Victor Sassoon's Bleach Mill near Alwaye, on 15th November 1936

† *Industry and the State*, Macmillan & Co., 1927.

APPENDIX.

TABLE I.

Statement showing the value of export and import of paddy and rice from 1040 M. E.

Year	Value of export	Value of import	Net import
	Rs.	Rs.	Rs.
1040	2,04,672	...	...
1041	85,669	...	...
1042	51,080	...	...
1044	45,800	...	...
1045	18,100	8,12,600	7,94,500
1046	22,300	13,07,400	12,85,100
1047	24,900	9,90,700	9,65,800
1048	...	10,20,000	10,20,000
1049	...	4,52,000	4,52,000
1050	...	6,69,000	6,69,000
1051	8,800	12,63,000	12,54,200
1052	79,700	11,56,530	10,76,830
1053	1,16,700	26,74,441	25,57,741
1054	41,500	13,53,411	13,11,911
1055	19,300	6,70,092	6,50,792
1056	9,400	9,74,203	9,64,803
1057	6,600	13,20,077	13,13,477

APPENDIX.

TABLE I. (*continued*)

Statement showing the value of export and import of
paddy and rice from 1040 M. E.

Year	Value of export	Value of import	Net import
	Rs.	Rs.	Rs.
1058	5,900	8,25,184	8,19,284
1059	13,413	12,20,058	12,06,045
1060	15,022	31,84,256	31,69,234
1061	18,091	20,44,981	20,26,890
1062	19,124	16,83,570	16,64,446
1063	40,051	13,65,137	13,25,086
1064	49,886	12,30,270	11,80,384
1065	48,155	13,10,360	12,62,205
1066	73,290	11,09,448	10,36,158
1067	78,216	5,46,626	4,68,410
1068	48,678	20,53,537	20,04,859
1069	56,033	21,24,842	20,68,209
1070	43,206	38,73,635	38,30,430
1071	36,840	28,97,562	28,61,722
1072	...	25,09,880	25,09,880
1073	...	23,17,804	23,17,804
1074	...	28,47,234	28,47,234

APPENDIX.

TABLE I. (*continued*)

Statement showing the value of export and import of
paddy and rice from 1040 M. E.

Year	Value of export	Value of import	Net impor
	Rs.	Rs.	Rs.
1075		29,48,104	29,48,104
1076	...	28,44,551	28,44,551
1077	...	34,30,471	34,30,471
1078	...	19,94,571	19,94,571
1079	...	25,68,638	25,68,638
1080	...	23,45,730	23,45,730
1081	...	28,04,676	28,04,676
1082	...	33,88,383	33,88,383
1083	...	48,47,676	48,47,676
1084	..	1,53,51,397	1,53,51,397
1085	...	74,22,240	74,22,240
1086	...	80,69,954	80,69,954
1087	...	89,40,444	89,40,444
1088	.	1,08,78,461	1,08,78,461
1089	.	1,28,99,773	1,28,99,773
1090	...	1,31,42,751	1,31,42,751
1091	.	1,43,66,519	1,43,66,519

APPENDIX.

TABLE I. (*concluded*)

Statement showing the value of export and import of
paddy and rice from 1040 M. E.

Year	Value of export	Value of import	Net import
	Rs.	Rs.	Rs.
1092	..	1,20,84,203	1,20,84,203
1093	..	1,19,20,296	1,19,20,296
1094	...	1,66,29,045	1,66,29,045
1095	...	2,35,15,613	2,35,15,613
1096	...	1,72,25,953	1,72,25,953
1097	...	2,26,87,037	2,26,87,037

APPENDIX.
TABLE II.
Exports to other countries.

Serial No.	Name of country	Value Bh. Rs.	Percentage of total value of exports of merchandise.
1	British India	3,18,14,059	33·74
2	Cochin	3,03,35,295	32·17
3	United Kingdom	2,11,78,247	22·46
4	Ceylon	13,22,376	1·40
5	Union of South Africa	1,87,239	0·20
6	Commonwealth of Australia	9,11,932	0·97
7	New Zealand	1,62,081	0·17
8	Germany	14,89,746	1·58
9	Netherlands	4,59,409	0·49
10	Belgium	1,43,289	0·15
11	Spain	2,10,604	0·22
12	Italy	2,78,164	0·30
13	United States of America	49,26,717	5·23
14	Other countries	6,57,551	0·70
15	Optional ports	2,11,197	0·22
	Total	9,42,87,906	100·00

APPENDIX.
TABLE III. ARTICLES EXPORTED.

Serial No.	Description of articles.	Unit.	Quantity.		Value in Bh. Rs.		Percentage of total value of exports of merchandise.	
			1112	1113	1112	1113	1112	1113
1	Areanuts	Cds.	11,011	14,744	11,36,586	16,44,293	1.2	1.8
2	Cardamoms	Cwt.	8,834	13,064	19,10,698	33,01,512	2.1	3.5
3	Cashew kernels	Cwt.	1,77,448	1,77,913	81,42,949	64,51,354	8.8	6.8
4	Coconuts	No.	2,68,58,205	3,43,12,983	10,57,587	9,03,641	1.1	0.9
5	Coconut oil	Cwt.	4,65,960	6,34,321	88,64,628	59,51,499	9.6	6.3
6	Coffee	lbs.	7,56,387	8,86,012	1,52,104	1,87,875	3.2	0.2
7	Coir all sorts	...	...	...	1,36,95,881	1,64,10,624	14.8	17.4
8	Copra	Cwt.	2,83,559	4,45,081	37,75,412	41,95,285	4.1	4.4
9	Fish all sorts	Cwt.	5,48,997	2,35,377	21,21,127	20,57,769	2.3	2.2
10	Ginger all sorts	Cwt.	79,539	1,03,604	25,36,190	21,54,302	2.7	2.3
11	Hides	...	...	...	4,37,283	4,83,074	0.5	0.5
12	Jaggery	Cwt.	61,879	79,633	2,53,426	2,89,894	0.3	0.3
13	Lemon grass oil	lbs.	7,77,818	8,56,942	6,08,361	7,13,081	0.7	0.8
14	Pepper	Cds.	28,377	40,935	35,61,800	32,16,635	2.8	3.4
15	Punnac	Cwt.	2,15,271	2,73,470	8,11,391	4,83,112	0.9	0.5
16	Rubber	lbs.	2,06,46,635	1,95,19,480	71,86,518	74,39,464	7.8	8.0
17	Tamarind all sorts	Cwt.	62,730	61,875	3,18,044	2,70,699	6.3	0.3
18	Tea	lbs.	3,07,80,610	3,32,35,348	1,96,22,922	2,25,61,823	21.3	23.9
19	Timber	...	...	...	7,93,738	8,60,404	0.9	0.9
20	Turneric	Cwt.	26,458	23,181	2,27,393	2,17,676	0.2	0.2
21	Monazite	Tons.	2,642	5,048	3,55,890	5,35,104	0.4	0.6
22	Ilmenite	Tons.	1,47,493	2,40,280	20,63,420	28,83,356	2.2	3.1
23	Zircon	Tons.	978	1,922	76,127	1,44,124	0.1	0.2
24	Silliminite	...	44	120	3,600	9,120	...	...
25	All other articles	...	...	...	1,35,79,502	1,08,72,206	14.1	11.5
Total					9,22,92,577	9,42,87,906	100.0	100.0

APPENDIX.

TABLE IV.

Number of workers in factories and their wages, 1936-37.

Nature of factories.	No.	Number of hands employed.			Average wages per day.		
		Males.	Females	Total	Men.	Women	Children
Tea factories	85	2,020	741	2,761	7 to 9 as.	4 to 5 as.	4 as.
Coin factories	26	9,275	1,032	10,907	8 to 10 as.	5 to 7 as.	4 as.
Cashewnut factories	39	1,570	4,758	6,328	4 to 5 as.	3 to 4 as.	2 as.
Tile factories	12	1,692	95	1,787	7 as.	5 as.	4 to 5 as.
Oil mills	13	955	...	955	3 to 12 as.	...	5 as.
Rubber manufactory	9	136	16	152	6 as.	4½ as.	3½ to 4 as.
Paper mills	1	69	22	91	As. 4 to Re. 1-6-0	3 to 4½ as.	2 to 3½ as.
Mineral factories	3	1,134	...	1,134	4 to 7 as.	...	3 to 4 as.
Cotton weaving. &c.	1	760	90	850	6 to 12 as.	3 to 5 as.	...
Steel works	1	184	...	184	6 as. to Rs. 3	...	3 to 6 as.
Mechanical works	1	120	...	120	Re. 1-5-0	...	...
Cardamom	1	5	3	8	6 as.	4½ as.	...
Travancore Cables &c.	1	169	9	178	4 as. to Re. 1-8-0	4 to 10 as.	...
Travancore Sugars	1	149	1	150	7 as.	7 as.	...
Total	192	17,920	7,357	25,277	...	...	...

N. B. This table is worked out from the Statistics of Travancore for 1112 M. E.

APPENDIX.

TABLE V.

Number of workers in factories and their wages, for 1911.*

Particulars of industries.	No.	No. of hands employed		Total.
		Males.	Females.	
1. Tea plantations	12	647	347	994
2. Tea factories	25	1,047	421	1,468
3. Rubber plantations	10	1,505	586	2,091
4. Rubber factories	2	292	113	405
5. Plumbago mines	5	803	225	1,028
6. Cotton spinning factories	1	31	3	34
7. Cotton weaving factories	3	95	...	95
8. Coir factories	6	1,558	425	1,983
9. Fibre factories	2	474	441	915
10. Carpentry works	3	99	...	99
11. Mint	1	26	...	26
12. Engineering work-shops	1	265	...	265
13. Monazite sand factories	1	17	11	28
14. Brick and tile factories	8	1,469	41	1,510
15. Salt factories	3	699	49	748
16. Oil mills	12	648	11	659
17. Copra out-agencies	1	37	...	37
18. Paper mills	1	92	8	100
19. Stamp Manufactory	1	35	...	35
20. Rice mills	3	62	26	88
21. Lace making factories	1	...	1,749	1,749
22. Printing presses	7	521	2	523
23. School of Arts	1	60	1	61
Total	108	10,482	4,459	14,941

* This table is adopted from the Industrial Census of 1911.

APPENDIX.
TABLE VI.
Daily wages of agricultural labourers.*

No.	Taluk.	1880-1885		1885-1890		1890-1895		Remarks.
		As.	Ps.	As.	Ps.	As.	Ps.	
1	Thōvāla	Males. Females.	3 4 1 8	Males. Females.	3 4 1 8	Males. Females.	3 4 1 8	In times of pressure slight increase of wage is given.
2	Agasthiēwāram		2 3		2 3		2 3	1 a. 8 ps. is given to labourers permanently in the service of land-lords.
3	Irāniel		3 0		3 0		3 0	
4	Kalkulam	Males. Females.	2 10 1 8	Males. Females.	2 10 1 8	Males. Females.	2 10 1 8	
5	Vilavancōde	Ranging from to	1 8 3 11	Ranging from to	1 8 3 11	Ranging from to	1 8 3 11	The wages for harvest- ing is 5 to 8 nālis of paddy. Rates often vary within wide lati- tudes.
6	Neyyātinkara		3 11		3 11		3 11	Rates often vary within wide latitudes.
7	Trivandrum		2 10		3 11		5 1	Do.

* This table was compiled from information supplied by the Division Peishkars in reply to a requisition from the British Resident, dated 31st August 1896.

APPENDIX.

TABLE VI. (*continued*)

Daily wages of agricultural labourers.

No.	Taluk	1880-1885		1885-1890		1890-1895		Remarks.
		As.	Ps.	As.	Ps.	As.	Ps.	
8	Nedumangād	5	8	6	9	7	10	These fairly represent the wages paid to labourers in cornec-tion with planting industry. Rates vari-able.
9	Chirayinkil	2	3	3	5	4	6	
10	Quilon	2	9	3	6	4	0	
11	Karunāgappally	3	0	4	0	8	0	
12	Kāṭhikappally	3	0	3	0	3	0	
13	Māvēlikkara	2	0	2	0	3	0	
14	Chengannūr	3	6	3	6	3	6	
15	Thiruvalla	4	0	4	0	4	0	
16	Ampalapula	3	0	3	0	3	0	
17	Kunnathūr	3	0	3	0	3	0	
18	Koṭṭarakara	4	0	4	0	4	0	
19	Paṭhanapuram	3	6	3	6	3	6	
20	Shenkōtta	1	8	1	8	2	6	

APPENDIX.

TABLE VI. (*concluded*)
Daily wages of agricultural labourers.

No.	Taluk	1880-1885		1885-1890		1890-1895		Remarks.
		As.	Ps.	As.	Ps.	As.	Ps.	
21	Shērthala	2	0	2	10	3	6	
22	Vaikom	2	8	3	5	4	0	
23	Ettumānūr	2	8	3	6	4	6	
24	Kōttayam	2	0	2	10	3	6	
25	Changanāśśēry	2	0	2	10	3	0	
26	Mīnachil	2	3	3	0	4	0	
27	Mūvāttupūla	2	0	3	0	4	0	
28	Thodupūla	2	0	3	0	4	0	
29	Kunnañhunād	2	4	3	5	4	0	
30	Alangād	2	10	3	0	4	0	
31	Parūr	2	10	3	5	4	0	

APPENDIX.
TABLE VII.
The cost of cultivation, yield and net income of Kuttanad punja fields
before and during the economic depression.

For Kaṛappāḍam.

	Before the depression			During the depression		
	Rs.	Price of paddy per para.	Paddy equivalent.	Rs.	Price of paddy per para.	paddy equivalent.
Expense of cultivating 1 acre in cash	12	chs. 18	paras. 19	10	chs. 10	paras. 28½
Do. • in paddy	3	Do.	40	3	Do.	50
Tax	15	18	4¾	13	10	8½
Total	...	...	63¾	...	...	87
Average yield 12 fold	...	...	120	...	...	120
Net income	...	...	156¾	...	...	33
For Kēval Rēclamation.						
Pumping charges	22½	18	47½	20	10	57
Chavara, labour, &c.	7½	Do.	4	2½	Do.	7
Tax	21	Do.	50	...	...	60
In paddy	...	...	101½	...	...	124
Total	32½	...	140	...	...	140
Yield at 14 fold	...	...	38½	...	...	16
Net income	...	...	...	...	...	...

APPENDIX.

TABLE VIII.

The value of vehicles and accessories imported
(dutiable and free).

Year	Motor cars and accessories	Cycles and accessories	Petrol
	Rs.	Rs.	Rs.
1100	2,62,087	50,070	1,62,191
1101	2,93,408	99,269	2,53,326
1102	5,63,307	67,190	6,62,001
1103	4,95,370	55,841	9,39,109
1104	11,10,464	66,112	20,62,114
1105	11,84,254	1,09,380	20,83,667
1106	10,46,515	57,231	43,80,922
1107	2,61,718	69,764	27,26,833
1108	3,46,825	1,33,035	27,03,419
1109	5,60,997	1,15,420	33,13,879
1110	4,97,245	42,795	35,56,978
1111	4,85,789	95,287	30,58,041
1112	7,58,501	1,70,927	37,39,650

APPENDIX.

TABLE IX.

Abkari revenue including opium and ganja
from 1098 to 1112.

Year	Total revenue	Revenue per head			Population
		Rs.	ch.	c.	
1098	Rs. 24,13,126	...	16	14	4,006,062
1099	23,67,070	...	16	9	do.
1100	26,22,134	...	18	5	do.
1101	29,12,951	...	20	5	do.
1102	31,97,977	...	22	3	do.
1103	33,00,060	...	23	...	do.
1104	39,69,945	...	27	11	do.
1105	39,95,119	1	...	2	do.
1106	27,31,457	...	15	...	5,095,973
1107	25,43,066	...	14	...	do.*
1108	27,35,769	...	15	3	do.
1109	23,53,253	...	13	1	do.
1110	25,41,964	...	13	11	do.
1111	23,60,677	...	13	1	do.
1112	24,28,974	...	13	5	do.

* The increase of population since the last census has not been ascertained.

APPENDIX.

TABLE X.

Arrack consumption.

Year	Jaggery arrack. Pr. Gls.	Coco- brandy. Pr. Gls.	Total Pr. Gls.	Consumption per head. Drams	Duty per proof gallon
					Rs. chs. c.
1098	1,20,638.40	148.22	1,20,786.62	1.46	3 22 14
1099	1,05,668.45	113.62	1,05,782.07	1.30	3 22 14
1100	1,11,341.63	465.05	1,11,806.70	1.35	4 2 0
1101	1,14,735.60	426.05	1,15,161.65	1.39	4 2 0
1102	1,17,266.0	713.74	1,17,979.79	1.42	4 16 4
1103	1,29,594.13	795.43	1,30,389.63	1.57	4 16 4
1104	1,35,513.68	819.93	1,36,333.66	1.64	4 23 6
1105	1,23,128.44	680.82	1,23,809.26	1.50	4 23 6
1106	76,863.10	535.86	77,399.02	0.73	5 6 1
1107	57,634.93	392.68	58,027.63	0.55	5 6 1
1108	55,479.8	1,186.46	57,666.26	0.54	5 11 7
1109	51,112.34	876.11	51,988.45	0.49	5 11 7
1110	48,204.25	386.11	49,190.36	0.47	5 11 7
1111	37,803.89	958.39	38,762.28	0.37	5 11 7
1112	47,024.45	1,094.53	48,118.98	0.46	5 11 7

TABLE XI.
Tree Tax.

Year	Number of trees licensed for fermented toddy.			Number of trees licensed for sweet toddy.				Tree tax.						
	Number of trees licensed for fermented toddy.			Number of trees licensed for sweet toddy.				Palmyra.		Coconut.		Chündappana.		
	C	P.	Ch.	C.	P.	Ch.		B. Rs.	As.	P. B. Rs.	As.	P. B. Rs.	As.	
1098	46,855	11,155	14,066	966	240	77	Parakkadavu, Edappally north & south Varapuzha Vadakkakara, Puthenvelikara & Puthenchira pakuthies of the Parur taluk and Chamanad and Thrikkakara pakuthies of the Kunne-thunad taluk.	3	8	0	6	0	10	0
1099	47,363	11,557	14,658	831	225	78		3	8	0	6	0	10	0
1100	85,780	12,213	18,239	685	255	58		3	0	0	4	0	7	0
1101	84,923	12,607	18,099	747	33	76	In the other parts of the State.	3	8	0	6	0	10	0
1102	91,765	12,900	19,754	699	85	82	Parakkadavu, &c.	3	0	0	5	0	10	0
1103	89,225	13,473	20,243	782	75	112	All other parts.	3	12	0	6	12	0	0
1104	98,844	14,152	21,392	788	50	85	As in riot.	2	12	0	7	0	14	0
1105	93,230	14,169	21,027	690	...	88	Throughout the State.	3	12	0	7	0	14	0
1106	61,644	13,729	11,514	492	40	51		4	0	0	8	0	16	0
1107	56,307	13,326	11,144	588	75	104		4	0	0	8	0	16	0
1108	60,662	13,326	11,411	566	70	112		4	0	0	8	0	16	0
1109	58,569	13,050	10,791	1,697	25	104		4	0	0	8	0	16	0
1110	68,019	13,654	12,648	1,725	...	177		4	0	0	8	0	16	0
1111	60,793	14,432	12,895	816	20	199		4	0	0	8	0	16	0
1112	63,461	14,351	15,022	844	...	216	In the Piravann Excise Division.	4	0	0	8	0	16	0

C=Coconut. P=Palmyra. Ch=Chündappana (Sogo palm).

TABLE XII.

The quantities of opium and ganja consumed in Travancore from 1098 to 1112 and the consumption per head of population.

Year	Total opium consumed	Total ganja consumed	Consumption per head		Popu- lation
			Opium	Ganja	
	Srs.	Srs.	Tolas	Tolas	
1098	4,703	2,285	·090	·045	4,006,062
1099	4,367	3,630	·087	·072	Do.
1100	4,431	4,396	·088	·087	Do.
1101	4,544	4,937	·090	·098	Do.
1102	4,444	5,112	·088	·102	Do.
1103	4,395	5,521	·088	·110	Do.
1104	4,290	5,881	·085	·117	Do.
1105	3,862	6,257	·077	·125	Do.
1106	3,060	5,947	·048	·093	5,095,973
1107	3,093	4,941	·049	·078	Do. *
1108	3,059	5,099	·048	·080	Do.
1109	3,017	4,996	·048	·078	Do.
1110	2,809	4,737	·044	·074	Do.
1111	2,556	3,740	·040	·059	Do.
1112	2,016	3,852	·041	·060	Do.

* The increase in population since the last census has not been ascertained.

TABLE XIII.

The issue price of opium and ganja for the years
1098 to 1112.

On the last day of each year	Issue price of opium per seer B. Rs.	Issue price of ganja per seer B. Rs.
1098	72	26
1099	72	26
1100	76½	26
1101	76½	26
1102	76½	27½
1103	81½	27½
1104	81½	30
1105	81½	30
1106	81½	30
1107	81½	30
1108	81½	32½
1109	81½	32½
1110	82½	32½
1111	82½	32½
1112	87	32½

TABLE XIV.

The consumption of raw and manufactured tobacco and
the revenue derived therefrom.

Year	Raw tobacco		Bædi tobacco		Beedies	
	Cds.	S. Rs.	lbs.	Rs.	lbs.	B. Rs.
1098	19,110	19,99,281	4,29,692	1,20,320	22,451	6,291
1099	17,759	18,56,129	4,23,945	1,18,711	22,686	6,361
1100	18,228	19,11,901	4,93,736	1,38,268	22,178	6,220
1101	19,644	19,71,389	5,00,300	1,40,105	23,786	6,674
1102	19,495	20,18,225	5,50,799	1,54,243	27,078	7,592
1103	21,527	22,40,046	6,31,183	1,76,741	34,603	9,700
1104	20,722	21,48,607	6,19,980	1,82,901	35,197	10,387
1105	20,273	21,09,280	6,97,759	2,93,078	33,645	14,151
1106	19,766	20,58,156	6,28,475	2,63,972	34,826	14,643
1107	19,165	22,52,559	7,21,043	3,03,003	27,440	11,507
1108	19,231	23,92,698	7,53,898	3,17,264	28,839	12,190
1109	19,542	24,48,879	7,86,625	3,31,219	32,522	13,708
1110	17,634	22,08,428	8,42,405	3,54,009	36,984	15,552
1111	16,867	21,13,033	8,72,881	3,66,722	35,005	14,720
1112	18,233	22,88,590	9,49,022	3,98,547	37,886	15,925
1113	17,071	21,49,066	10,31,597	4,33,310	40,242	16,925

TABLE XIV. (*continued*)

The consumption of raw and manufactured tobacco and
the revenue derived therefrom.

Year	Cigarettes		Cigars		Snuff	
	lbs.	B. Rs.	lbs.	Rs.	lbs.	Rs.
1098	20,145	7,763	36,612	10,257	29,170	4,972
1099	20,937	8,836	35,654	9,990	39,242	6,698
1100	26,287	10,734	36,130	10,144	49,898	8,512
1101	36,271	14,691	35,960	10,077	49,806	8,499
1102	30,423	17,033	42,585	11,946	48,077	8,205
1103	48,501	22,862	44,801	12,550	51,584	8,800
1104	59,109	30,747	51,018	15,176	52,175	9,488
1105	52,834	41,412	48,747	20,485	53,860	13,770
1106	34,730	71,358	44,709	18,784	52,469	13,405
1107	35,058	34,106	41,759	22,734	66,999	15,510
1108	40,273	35,936	32,144	20,257	73,218	18,306
1109	35,262	40,156	31,821	20,052	78,510	19,633
1110	49,993	42,517	29,402	18,541	83,656	20,915
1111	44,068	45,260	25,690	16,190	83,607	20,901
1112	63,378	54,128	26,966	16,996	86,908	21,727
1113	...	57,345	26,453	16,671	89,172	22,294

TABLE XIV. (*concluded*)

The consumption of raw and manufactured tobacco and
the revenue derived therefrom.

Year	Other items		Total of tobacco preparation	Consumption of raw tobacco per head.
	lbs.	Rs.	Rs.	lb.
1098	23,233	6,506	1,56,109	4·29
1099	13,944	3,905	1,54,501	3·98
1100	5,693	1,594	1,75,472	4·09
1101	2,730	765	1,80,811	4·41
1102	2,202	619	1,99,638	4·38
1103	973	274	2,30,927	4·84
1104	635	181	2,48,880	4·66
1105	2,497	704	3,83,600	4·55
1106	4,265	1,201	3,83,363	3·49
1107	3,318	1,207	3,88,067	3·38
1108	1,622	683	4,04,636	3·40
1109	1,218	513	4,25,281	3·45
1110	1,540	650	4,52,184	3·11
1111	3,387	1,431	4,65,224	2·98
1112	4,530	1,908	5,09,231	3·20
1113	5,904	2,488	5,49,033	3·15

APPENDIX.
TABLE XV.
Salt.

Year.	Salt production.			Salt sale.			Total Revenue. Rs.	Revenue per head. ch. c.
	Salt manufac- tured in the local factories. Mds.	Foreign salt im- ported. Mds.	Total. Mds.	Local salt. Mds.	Foreign salt. Mds.	Total. Mds.		
1098	5,64,458	5,41,719	11,06,177	3,29,482	7,27,476	10,56,958	21,59,254	14 13
1099	3,40,035	7,59,243	10,99,278	3,73,700	7,03,139	10,76,839	23,42,207	16 6
1100	4,04,354	7,12,570	11,16,924	4,20,097	7,27,765	11,47,862	16,90,934	11 12
1101	4,07,466	8,96,739	13,04,205	3,32,576	7,99,685	11,32,261	16,39,823	11 7
1102	6,78,380	5,53,134	12,31,514	4,04,366	7,24,367	11,28,733	16,97,463	11 14
1103	9,87,515	6,42,549	16,30,064	5,93,805	5,87,319	11,81,124	19,20,760	13 7
1104	7,64,413	5,18,339	12,82,752	6,15,092	6,01,677	12,16,769	18,86,527	13 3
1105	7,93,965	3,09,245	11,03,210	8,57,887	3,41,913	11,99,800	18,76,915	13 2

APPENDIX.
TABLE XV. (concluded)
Salt.

Year.	Salt production.			Salt sale.			Total Revenue. Rs.	Revenue per head. ch. c.
	Salt manufac- tured in the local factories. Mds.	Foreign salt im- ported. Mds.	Total. Mds.	Local salt. Mds.	Foreign salt. Mds.	Total. Mds.		
1106	10,11,249	2,38,780	12,50,029	9,01,500	2,92,944	11,94,444	18,59,965	10 3
1107	11,63,044	2,26,623	13,89,667	9,54,584	2,44,027	12,00,611	22,05,310	12 2
1108	7,43,857	1,93,909	9,37,766	9,62,960	2,04,593	11,67,553	21,69,359	11 15
1109	8,70,614	4,95,912	13,66,526	9,77,276	2,19,666	11,96,942	22,25,769	12 4
1110	17,10,654	2,13,262	19,23,916	7,43,354	4,29,354	11,72,708	22,11,228	12 2
1111	13,38,358	87,489	14,25,847	10,37,418	1,77,204	12,14,622	21,79,533	12 —
1112	17,52,075	67,962	18,20,037	11,41,986	96,132	12,38,118	22,22,292	12 3
1113	12,56,989	14,703	12,71,692	12,06,665	36,566	12,43,231	28,77,999	12 —

TABLE XVI.
Customs.

Year	Land customs				Sea customs			
	Exports		Imports		Exports		Imports	
	Rs.	ch. c.	Rs.	ch. c.	Rs.	ch. c.	Rs.	ch. c.
1098	17,03,943	22 6	1,63,244	19 3	6,08,097	18 3	25,738	20 5
1099	16,15,735	7 10	1,57,873	15 5	6,58,833	10 6	20,477	19 15
1100	16,74,873	5 1	1,78,823	13 14	8,77,636	19 4	66,003	18 0
1101	16,43,316	0 13	1,83,873	8 ...	10,59,737	8 0	1,22,987	2 10
1102	16,89,198	27 15	2,03,646	19 3	12,15,221	25 1	1,32,836	8 15
1103	17,96,807	2 3	2,25,030	1 1	9,33,644	17 5	2,13,305	2 14
1104	17,22,166	7 14	2,26,873	11 1	10,68,614	25 5	2,19,264	8 4
1105	18,19,838	27 13	3,30,788	8 3	10,39,713	8 2	2,90,372	2 2
1106	17,11,641	13 2	3,07,688	12 14	11,56,040	5 3	3,07,387	27 2
1107	14,49,224	7 ...	3,58,251	8 6	7,56,285	21 13	2,19,229	5 6
1108	14,14,305	6 8	3,82,003	24 4	8,46,255	20 12	4,12,835	12 15
1109	16,27,704	14 12	4,06,307	8 7	8,54,693	12 12	2,55,192	7 7
1110	15,44,719	12 11	4,05,804	4 7	5,30,321	8 0	2,93,272	18 3
1111	13,27,329	14 11	3,99,214	6 10	6,17,009	6 13	3,93,511	22 1
1112	15,05,889	16 15	4,47,818	7 11	4,92,318	25 13	2,51,811	10 6
1113	17,42,333	0 0	4,99,383	23 15	7,06,560	26 3	2,46,335	9 15

TABLE XVI (Concluded).
Customs.

Year.	Receipts from British Government.			Miscellaneous.			Total.			Revenue per head.		
	Cochin Harbour Agreement.			Interportal Convention.			Rs.			Rs.		
	Rs.	ch.	c.	Rs.	ch.	c.	Rs.	ch.	c.	Rs.	ch.	c.
1098				10,543	8	13	12,396	12	0	25,23,964	16	14
1099							11,430	13	10	24,84,350	10	8
1100				26,916	21	5	14,028	12	5	28,38,282	5	13
1101							13,823	18	13	30,23,737	10	4
1102				985	9	15	13,571	5	15	32,55,460	13	0
1103							15,598	5	0	31,84,385	0	7
1104							16,583	14	10	32,53,502	11	2
1105							16,396	22	6	34,97,110	9	10
1106							14,681	22	9	34,97,438	27	14
1107							13,188	24	14	27,96,179	11	7
1108	12,94,430	8	8				13,522	10	0	43,63,352	26	15
1109	9,09,100	3	8				15,486	22	2	40,68,484	19	0
1110	11,38,954	18	8				15,738	14	13	39,28,810	20	10
1111	13,38,646	0	8				13,028	1	10	40,88,738	24	5
1112	24,41,597	4	9				13,843	9	14	51,53,278	19	4
1113	9,26,236	14	3				16,821	0	7	41,37,670	18	11

BIBLIOGRAPHY.

- Appādorai.
- Bartholomew, Fra.
- Bourdillon, T. F.
- Dutt, R. C.
- Nāgam Aiyā, V.
- Mateer, Rev. S.
- Padmanābha Menon, K. P.
- Rāmaswāmy Aiyar, Sachivōthama,
Sir C. P.
- Srīnivāsaśāghaviengār,
- Ward and Conner.
- The Indian Trade Journal.
- Report on the Economic and
Commercial conditions in the
Republic of Honduras.
- Report on Economic and Commercial
conditions in Portuguese East
Africa.
- The Agricultural Debt Redemption
Committee Report.
- The Economic Depression Enquiry
Committee Report.
- The Minor Irrigation Committee
Report.
- The Banking Enquiry Committee
Report.
- The Unemployment Enquiry Com-
mittee Report.
- The Education Reforms Committee
Report.
- Travancore Census Reports, 1881,
1891, 1901, 1911, 1921, 1931.
- Administration Reports of the
Government of Travancore from
1030.
- Statistics of the Travancore Govern-
ment.
- Commercial Review.
- Economic conditions in Southern
India, Vols. I and II.
- A Voyage to the South Indies.
- The Forests of Travancore.
- Economic History.
- The State Manual, 1906.
- Land of Charity!
- Native Life in Travancore.
- History of Kēraḷa, Vols. I to IV.
- Speeches enunciating the economic
policy of the State.
- Forty Years' Progress of the
Madras Presidency.
- A Memoir of the Survey of the
Travancore and Cochin States.

CHAPTER XV

LAND TENURES AND LAND TAXES

PART I—LAND TENURES

If the economic position of a country depends on the laws and customs which regulate the demand and supply of land, labour, and capital, the importance of land, the first of the agencies of production in an agricultural state like Travancore can never be over-estimated. The conditions of land tenure and the nature of the demands made on the produce of husbandry by the state and the landlord class shape the outlook of the cultivating classes and determine the scope of their enterprise. Fixity of tenure is therefore of paramount importance and Travancore has had this fixity for a long time. The lands fall under two main classes, *paṇḍāravaka* land and *jenmom* land. The principles which regulate the ownership and possession of land in Travancore are in many respects due to the theories and incidents of *paṇḍāravaka* and *jenmom* lands with certain modifications which are the result of historical causes.

The laws relating to land tenures in Travancore bear the marks of certain theories advanced by writers, judges and administrators who unconsciously impressed into their service the rules which regulate the relationship between sovereign and subject and that between landlord and tenant in other parts of Kēraḷa and beyond. As Travancore came to be regarded as an integral part of Kēraḷa, generalisations of the principles which were made on the basis of facts gathered

by British administrators and others in Malabar were held to be applicable to this state as well. In Malabar were found a large number of opulent jenmis owning extensive landed properties. The tenants were more or less at their mercy, though custom was a protecting bulwark of tenant rights. The invasion of Hyder Ali and Tippu Sultan had brought into existence a new order of things. Stringent measures were adopted by them to realise the full amount of the taxes. The proprietors of estates who desired to evict their tenants obtained support from the officers who interpreted the ruling customs according to their own lights. The Kēraḷōlpaṭhi, the Kēraḷamāhātmyam and the traditions recorded in them were taken as the truth, the whole truth and nothing but the truth. The twelve years' rule in regard to tenancy was fashioned upon the periodic celebration of Māmānkam once in twelve years. "All tenures of land subsisted only for that period; all transactions, appointments, contracts and tenures had to be renewed at the end of twelve years"* . These were the impressions formed by the earlier British officers in regard to the mutual rights and obligations of jenmis and kuḍiyāns in Malabar. The inference was soon raised that the tenant could be turned out of the land by the jenmi. But the case of Travancore was different. This is admitted by the British Resident in Travancore and Cochin in a letter to the Dewan of Travancore, Sir T. Mādhava Rao:—

"It seems clear from the researches made into the subject that, by established custom having the force of law, the jenmi or proprietor, in granting lands on 'kāṇappāṭṭom' tenure, alienates under certain conditions his proprietary right, which is only revocable in certain extreme cases, and that the tenant, so long as he pays the stipulated amount of rent and fees and acquiesces in the readjustment of the former, at fixed periods, on fair and reasonable terms, cannot be arbitrarily ousted by the jenmi; even on conditions

* History of Kēraḷa; K. P. Padmanābha Menon, Vol. II, p. 385.

of the payment by the latter of compensation for improvements.

“The custom in Travancore seems to have been undisturbed by the influence of foreign invasion such as occurred in the neighbouring district of Malabar, and to remain here pretty much in its integrity, so that there have been fewer difficulties in dealing legally with cases arising out of it than in Malabar where it became unsettled by Tippu’s measures, and it is not unnatural that the conclusions arrived at in the British courts should not always exactly coincide with the practice in Travancore which has been on the side of upholding the tenants’ rights. Doubts, however, have, at times, been raised, and, probably, for the most part from the analogies of the British courts, but these do not seem to have materially disturbed the general rule of practice”.*

The matter was clearly explained by Mādhava Rao himself in a letter addressed to H. Nevill Esq., under date the 12th June 1867.

“The question has been agitated only in recent times, i.e., the last 30 or 40 years. Before that there was scarcely any doubt, and I believe nobody thought that the jēnmi could turn out the kāṇappāṭṭom tenant. But doubts began as persons from the East Coast began to hold office in Travancore. They came from a part of India where the Kāṇappāṭṭom tenure is not known and where a person holding lands from Government can turn out his tenant. The whole question was mistaken, and false analogies misled. While these persons from the East Coast more and more pressed their views they imported from British India, they were not opposed by advocates of the local custom and tenures in a sufficiently effective manner. In fact, I have never seen any one systematic attempt to explain the custom and to defend it upon grounds intelligible to British bred officers.

“The consequence has been naturally increasing doubts.

* Letter No. 552 dated the 19th July 1867.

"I have said that these doubts originated with persons who came from the East Coast and held high office here, and who wrongly applied their notions of East Coast tenures to those of the West Coast.

"But other causes may be assigned for further complication.

"A Numboory Brāhmin held the office of a judge in the highest court for a long time. The other judges were mostly East Coast men. The Numboory judge was himself a jenmi and had *strong* sympathies for the jenmi class. His views therefore concurred with those of the East Coast judge; and the opinion thus formed against the tenant became very powerful.*

"The tenant *had strong* reasons in his favour, but he had no advocate to set forth his side with any effect, while the jenmi had for his counsel all the high officers of state who came from the East Coast and those who, though natives of this Coast, had strong sympathies for the jenmi.

"It is in consequence of this state of things that a struggle has been so long kept up between opinion on one side and custom on the other.

"But here in Travancore, nothing is clearer than that we have such a custom; and, not only has this custom existed for centuries, but it has suffered no interruption as was supposed to have been the case in Oudh during Mohomedan rule. If it was contended in Oudh that custom, even though interrupted during the long period of an alien rule, should be recognised, ours here is a still stronger case inasmuch as our custom has continued uninterrupted down to the present generation".

Despite the above considerations the ideas certified by judges and administrators soon became current. In every discussion of the subject of tenures the alleged grant by Paraśurāma assumed prominence and became the

* This appears to be a surmise. The Nampūthiris are not less honest in the discharge of public duty than the members of other castes.

corner-stone of belief. Writers followed it with veneration. The result is that it has come to be recorded in the most authoritative documents and books that originally all land in Travancore belonged to the Brahman jenmis and that the Government obtained the rights over land only by purchase, escheat, confiscation and such like methods. In other words, it is said that the State succeeded by various means to the privileges which the Brahman jenmis exercised from the time of Paraśurāma's grant in uninterrupted continuity. If this argument is accepted, it becomes difficult to explain how the non-Brahman jenmis became sole owners of large tracts of land in Travancore. The obsession of ideas was responsible for the erroneous interpretation of ancient origins. The real explanation appears to lie in the fact that land originally belonged to those who were in beneficial occupation. This is similar to the principle of *occupatio* in Roman Law. "According to what may be termed the Hindu Common Law, a right to the possession of land is acquired by the first person who makes a beneficial use of the soil. The crown is entitled to assess the occupier with revenue, and if a person who has occupied lands omits to use it and the claim of the crown to revenue is consequently affected, the sovereign is entitled to take measures for the protection of the revenue".*

"At the commencement of the century it was the policy of the Government to allow all lands to become private estates where that was possible.† (i) The Despatch and order of the Governor General in Council on the annexation of Malabar dated the 31st December 1799 and the 18th June 1801 have not been adduced, but their purport appears from the Despatch of the 19th July 1804, quoted in Vaikunta Bapuji v. Government of Bombay. (ii) It was intimated that it never could be desirable that the Government itself should act as the proprietor of lands and should

* Secretary of State for India v. Vīra Rāyan, 9 M. 175.

† Despatch of Lord Wellesley, quoted in Bhāskara'appa v. the Collector of North Canara.

collect the rents from the immediate cultivators of the soil. When in 1808 the Board of Revenue suggested that an augmentation of revenue might be derived from waste lands reserved, they were informed that the Government did not look to any advantage of that nature beyond the benefit of increasing the amount of the public taxes in proportion to the existing taxes of the country.* It will be seen that at the time Government, so far from abrogating the Hindu law, intended to assert no proprietary right to the waste but limited itself to its claim to revenue. At the time Malabar came under British rule, all the forests were claimed as private property.† In their Despatch of the 17th December 1813, relating to the settlement of Malabar, the Directors observed that in Malabar they had no property in the land to confer, with the exception of some forfeited estates.‡ Although a different policy was subsequently pursued in other districts, especially in more modern times, and rules have been framed for the sale of waste lands, there is nothing to show that any such change was notified in Malabar up to a period much later".§

Generally in India the State made a claim to revenue from land from very early times as the price of protection given to the subjects from foreign invasions as well as internal troubles. The *shashīāmśā* or the sixth part of the produce of the soil was recognised as the legitimate portion of the king. Manu, Yājñavalkya, Gauthama, Baudhāyana, Nārada and Vishṇu recognise this right of the king in unmistakable language. So well established was the rule that if the crops were destroyed by the cultivator's fault the king was entitled to levy a fine from him in order to make good the loss to the State. However, the theory of land tenure in Malabar

* Fifth Report, Appendix 30, page 902; Revenue and Judicial Selection, Vol. I, p. 842.

† I. L. R. 3. Bom. 586.

‡ Revenue Selection, Vol. I, p. 511.

§ 9 Madras 175.

was distinguished from that which regulated the holding of land in other parts of the Madras Presidency. In Malabar the whole land was presumed to belong to some individual or corporation other than the government.

Thus jēnmom in Malabar came to mean exclusive ownership of the soil. The jenmis in Travancore were exempted from payment of taxation of lands. Public authorities in this State proceeded to rest on a conglomeration of confused ideas and concluded that all lands in Travancore belonged originally to Brahman jenmis. But the theory seems to be untenable when the law and positive morality in ancient Hindu States are clearly understood. The property of the Brahman was considered sacred on account of the spiritual service which he rendered or was expected to render and was regarded as of immense benefit to the State and its ruler. It was the State's duty to maintain Dharma as laid down in the Śāstras and recognised by contemporary opinion. Thus large immunities from taxation were claimed for and granted to Brahmans and ascetics. Even the right to escheat was confined to the properties of non-Brahmans. The rulers of Travancore always took pride in maintaining the ideals of kingship as held out in the śruthis and purāṇas and steadily followed the laws and conventions conceived in the interests of the Brahmans. In this view the State of Travancore could never profit by any confiscation of the property of the Brahmans, for such confiscation would mean a violation of sacred duty. If the theory that all lands belonged to Brahmans applied to Travancore at any time, the burden of proof is clearly upon those who subscribe to the theory to show how the rulers got over the prohibition in regard to the seizure of the property of Brahman jenmis. It may therefore be predicated that while the State exempted lands which belonged to Brahman jenmis from taxation, it respected the principle of the sovereign's right over all other lands in the kingdom. "It is a noteworthy point", observes

Śankarāsubba Aiyar, "that the mere circumstance of land being the property of a jenmi does not bring it under any of the tenures".

Thus, as pointed out by Dewan Śēshiah Śāstri,* "the normal condition of the jenmom tenure is absolute freedom from tax of any type. The tenure, however, ceases the moment it passes into alien hands (i.e., not jenmi) for a money consideration, whatever the nature of the transaction. When an alienation takes place, the land becomes liable to a light tax called *rājabhōgam*. The redemption of alienated land by the jenmi did not free him from payment of *rājabhōgam*, which 'continues to sit on the back of the land for ever and ever at the same rate without variation except for worse, that is, if in this condition the mortgagee dies heirless, the Sirkar seizes the tenure, (i.e., succeeds to the mortgagee's money), transfers the land to the head 'Sirkar' and pays to the jenmi (Landlord) the residue of rent (*Micchavāram*), if any was paid to him by the deceased. Again, if the land is abandoned (*Nir̥hul*) by the Kāṇam-holder on account of its becoming unfit for cultivation from various causes, it is at once transferred to 'Sirkar' and granted as a new Sirkar pāṭṭom tenure, if it is ever reclaimed".

Jenmis as a rule never alienated land by absolute sale except to other jenmis, whether brahmaswoms or dēvaswoms. The Māḍampimār are also prohibited to convey land by absolute sale.

The peculiarities of the jenmom tenure are :—

(i) That its normal condition is absolute freedom from taxation,

(ii) that this condition ceases the moment the land passes into the hands of others than dēvaswom or Brahman jenmis for a money consideration, provided that the mere letting out of the lands to a tenant for rent does not vitiate the tenure,

(iii) that on such alienation taking place, the land becomes liable to light tax to government called *rājabhōgam* which is a fee or light tax paid in acknowledgment apparently of fealty to the sovereign; the rate of *rājabhōgam* varies and is said to be $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$, or $\frac{1}{3}$ of the full assessment, the last three rates, however, being exceptional,

(iv) that the light assessment continues for ever a burden on the estate, even though the *kāṇam* is redeemed,

(v) that if the *kāṇamdār* dies heirless, the land lapses to the Sirkar, the *jenmi* being entitled only to any residue of rent (*micchavāram*) payable to him by the deceased, and

(vi) that if the *kāṇamdār* abandons the land as unfit for cultivation (*nirthul*), the Sirkar takes it and grants it again to any body who asks for it on full assessment.

The third head comprises all *jenmom* lands held by the *Māḍampimār* who are generally *Nāyar* or other chieftains not Brahmins. The characteristics of this tenure are:—

(1) That the lands are from the beginning subject to *rājabhōgam* which is levied whether they are in the hands of the *Māḍampimār* or others,

(2) that the tenure holds good so long as the land is not alienated by absolute sale, and

(3) that if an absolute sale takes place, the tenure becomes extinguished and the land is transferred to another class of tenures called *Otti* which will be noticed further on.

All lands other than *jenmom* are known as *paṇḍāra-vaka* or Sirkar property. Both the theory and practice in respect to them is that the Government is primarily the landlord and that whatever rights in them vesting in the *ryots* have been derived from the State. If the theory that originally all lands were *jenmom* property is correct, doubtless the Sirkar lands are lands which in process of time have become vested in the Government by escheat or otherwise.

But there are certain exceptional cases where *dēvaswom* or *brahmaswom* properties are taxed from the

beginning. There are also cases where lands of this and other jenmom classes are permanently tax free. It is a noteworthy point that the mere circumstance of a land being the property of a jenmi does not invest it with any exceptional characteristics. The privileges attach only to lands registered as jenmom in the government accounts.

"It is likely that the Brahmans, though they laid claim to the birth-right or jenmom in all lands, willingly left others, especially in places where the community did not settle in large numbers, to become owners, and in old Travancore extending from Cape Comorin to the estuary of Edavāi in the north there were, as already stated, originally very few Nampūthiri Brahman settlers. The following from Mac Lean's Manual of the Administration of the Madras Presidency is instructive. The characteristic of the whole of the Kēraḷa country was the presence of a strongly developed personal and individual land-property, the absence of a government tax on land, the absence of a concentrated village system such as obtained in the Carnatic, and the existence of a military tenure similar to the feudal system of Europe. The country was originally sub-divided between a race of Brahmans or priests called Nampūthiris and a military tribe called Nāyars: these two holding in subjection the agriculturists of the country, consisting of persons called Thīyar and others. The Nāyars paid no land-tax, but attended the kings to the field with their retainers. The Nampūthiris also paid no land-tax, but furnished the expenses for the support of the temples. In the ninth century a Zamorin of Calicut became a convert to Mohomedanism and about this time a large colony of Mohomedan settlers of Arabian descent were allowed to occupy lands in Malabar. These Mohomedans, called Māplāhs, were mostly merchants, and were equally exempted from payment of direct land-tax. In the absence of land-tax the kings of the country had considerable domains assigned to them, which were cultivated

by slaves and yielded a sufficient revenue for house-hold expenses”.

Nāgam Aiya says:— “It seems reasonable to suppose that the jenmis took for themselves all land nearest their dwellings and that the distant mountainous and jungle tracts were ownerless till the States grew up and acquired proprietary right over them. The ruling chiefs must have then claimed these tracts as their own along with others acquired by them as stated above, and granted them to the ryots for cultivation. This explains how the jenmom right in Travancore is recognised as antecedent to the sovereign’s right to the land. The right of the jenmis over land has been getting attenuated for now more than seventy years. The argument was frequently advanced that the tenants should be naturally entitled to the benefit of their labour devoted to the improvement of the land. The Sirkar is regarded as the owner of all lands which have not been appropriated in pursuance to law by individual families or other corporations. The principle which governs the relationship between the government and the majority of landholders in the State is the same as that which applies to the ryot-wari tracts in the Madras Presidency”.

In the following pages of this chapter the theories which are ordinarily accepted have been adhered to. The authoritative books and decisions of courts can be understood only in the light of facts and opinions which formed the basis for administrators, lawyers and judges. Until the tenures are simplified, the ruling theories will have to be respected.

SECTION A.—JENMOM LANDS. *

Travancore presents an interesting system of land tenures, the result of its peculiar historic development and the inter-action of local customs. Its immunity from foreign conquest has enabled

* The following account was drafted by Mr. K. S. Nā āyana Aiyar, Advocate.

it to maintain the essentials of land-holding substantially unimpaired. In many particulars it is similar to the system which obtains in the rest of Kēraḷa. Major Walker observes : "The first thing that strikes an early observer is the extent to which private right of property is recognised in Malabar. The Jenmikāraṇ possesses the entire rights in the soil. This much is certain that in no country in the world is the nature of this species of property better understood than in Malabar nor its rights more tenaciously maintained." "The lands in general appear to have constituted a clear private property, more ancient and probably more perfect than that of England". *

The great variety of unrestricted transfers of land and the creation of subordinate interests recognised by law give an indication of the value attached to the land by the owners, the absolute nature of the ownership in the soil and the extent to which the theory of full ownership was recognised. The fact that dēvaswom and brahmaswom lands are exempt from land-tax so long as they remain in the actual possession of the dēvaswoms and brahmaswoms and that the Government levies only rājabhōgam from alienees at the rate prescribed by the Hindu Śāstras shows that the ancient Hindu system as described in Manusmrithi † continues to this day in Travancore in substantial measure.

The traditional origin of the ownership in land in Malabar (Kēraḷa) is that the whole of Kēraḷa, including Travancore, was reclaimed from the sea by Paśaśūrāma and made over in free gift to the Brahman settlers brought by him from the other coast. This theory was accepted by the Madras High Court and has been judicially recognised by the courts of Travancore.‡ Another theory is that "the

* Fifth Report referring to Malabar and Canara.

† Manu, Chapter 7, Sloka 133.

‡ See Varki v. Govindan Kartha, 1. T. L. R. 2, and Krishnan v. Sankaran, 7 T. L. R. 93.

Brahmans as the most influential settlers asserted a superior right which was acquiesced in by the whole population". The Hindu idea of acquisition of title by occupation is an ancient one. It was recognised in Manusmrithi and has been accepted by the courts.* There is yet another theory. In ancient times all the lands of the State were owned by Nāgas or Nāyar chieftains when sovereignty was in the state of a tribal commune. Then there was no revenue or land-tax, but each member of the tribe contributed a small portion of the produce as tribute for the upkeep of the tribal chieftain. There was plenty of land not yet appropriated and therefore at the disposal of whosoever might choose to cultivate it. The Brahman colonisation of Kēraḷa brought with it an important change. The Nāyars and others were ready to acknowledge the Nampūthiris as their landlords and hold lands from them as tenants. Thus the ancient jenmom right came to be acquired by the Nampūthiris, Pōttis and other chieftains. The system did not last long. The Nāyar chieftains gradually became subordinate to the growing colony of Brahman settlers whose estates had become more extensive. The lands belonging to the ruling family grew in extent by the addition of escheats and lands abandoned by cultivators. These lands formed the nucleus of the present Sirkar lands. When the great Mār'hāṇḍa Varma Mahārāja (904-933) subdued these chieftains and subjugated their possessions, the lands vested in the Travancore Government by right of conquest.

Many are the theories advanced to explain the origin of jenmom. T. Kunjurāman Nāyar, a native of North Malabar, who was a judge of the Travancore High Court and drew up an authoritative memorandum on the subject explains it thus:—

"Jenmom lands".
Origin.

* Manu, Chapter 9, Sl. 44.

“ The organisation of the country for social and political purposes was of the pure Hindu type. The unit of the social system was the joint family which happily survives to the present day, and a number of joint families belonging to the early settlers in, or colonists of, Kēraḷam associated themselves for political and administrative purposes and established village communities, the Brahman village communities being designated grāmams, and the non-Brahman ones kara, piṭaka, cheri and muri, and later on dēsom. According to the traditional accounts, * the Brahmans who had been prevailed upon by Parāsurāma, the conqueror or discoverer of Kēraḷa, to colonise his new dominions and who, it is said, were rewarded by him with the gift of the whole land, after fixing the *thara* (Nāyar villages) and *sank'thams* (literally appointed places or a division of the Brahman dominions answering somewhat to the English Pale in Ireland), established sixty four grāmams or Brahman villages and introduced a sort of republican government. The actual government was vested in four kaḷakams or councils elected as representatives of the sixty four grāmams, assisted, or presided over, by an officer styled Ākshāpurushan (Protector) who was to be elected by the whole body as their Executive Officer and to remain in office for a period of three years each. Each kaḷakam further elected an Avarōjha Nampi to serve as a sort of Councillor to the Ākshāpurushan and lands..... adequate for the support of these officers were assigned to them severally. The office of Ākshāpurushan subsequently fell into disuse on the appearance in the country of some foreign Hindu noblemen who under the style and designation of Perumāls (or great personages) were allowed to rule the country for 12 years each, but was, at a later period, revived with all the privileges of the Perumāls.....

“ The original arrangement for the internal administration of the country by village communities continued,

* See Kēraḷolpathy.

however, for a very long time notwithstanding changes in the form of central government". 'The village community', to use the words of Lord Charles Metcalfe, 'possessed an inherent vitality in itself which preserved it amid the revolutions of power and the changes of dynasties. It was a little republic having its own territory and its own Municipal Government under a headman'. These headmen belonging to non-Brahman classes were, in later times, designated by the generic title of *Māḍampimār* and consisted of *Kymals*, *Karthās* and *Idaprabhūs*. These and other leading men were, at a very early time, allowed to take for themselves a portion of the land within their respective jurisdictions in return for the protection afforded by them to the rest of the community in the same way as the original *Ākshāpuṣhans* or Protectors.

"Land-taxes were unknown in *Kēraḷam* in ancient days. The Ruler—be he *Ākshāpuṣhan*, *Avaṛōdha Nampi*, *Dēsādhipathy*, *Nāḍuvāli*, or *Rāja*—derived his income from other sources than land-tax. The *Rājas* and *Peṛumāls* also do not appear to have exacted regular land-tax until a period when the necessity for warlike preparations ceased, though, when powerful enough, they levied forced contributions from land-holders in cases of emergency.

"The Brahmins in *Kēraḷa* were, at a very early period, shrewd enough to foresee that the halo of sanctity which encircled themselves might not be proof against the gradual degeneracy of religious feelings which time must produce, and they constitutionalised that sanctity by assigning large tracts of land and their revenues to certain temples built and consecrated by them. The actual governors or rulers of several villages (*dēsoms*) and latterly of *Nāḍus* (Provinces), imitating the example of Brahmins, founded and endowed other temples. Other persons also did the same.

"In later times the country was divided for the purpose of administration into *Nāḍus* (Districts or Provinces),

of which there were at one time 17, and subdivided into *dēśoms* (villages). The most successful of the village headmen, *Grāmādhipathis* or *Māḍampis*, ripened in a few instances into Chiefs of *Nāḍūs* in some places, and their domain was known by the names of *Swaṛūpams* and *Eḍavakays*. The village headmen were known in some places as *Dēśavālis* and, in others, as *Māḍampis*. *Dēśavālis* were at one time the sole proprietors of lands in their respective villages and they enjoyed in addition the following rights, if we are to credit the traditions current among the people.

“(i) The *Ampalapathi* or the direction of the religious ceremonies of the village pagoda.

“(ii) The *Ūrāima* or the management of pagoda lands and tenants.

“(iii) The control of all village ceremonies, such as marriages, &c.

“(iv) *Dēśādhipathyam* or the general superintendence of all affairs of the *dēśom* or village.

“The ranks of these petty chiefs in Travancore received additions from other sources. *Nampūthiri* Brahmans, who held sway over the *dēvaswoms* or pagodas possessing immense wealth and landed property, invoked the assistance of *Sāmantha* Kshatriyas, and these managed the *dēvaswoms* under the designation of *Kōviladhikārikaḷs*. The *dēvaswoms* exercised sovereign functions within the limits of their landed property as did the wealthy classes of Brahmans generally within the limits of their *Sankēthams* (tracts assigned to Brahmans). The life and liberty of the *dēvaswom* tenants were at one time at the mercy of these communities....

“None of the petty rulers of various *Nāḍūs* composing modern Travancore were probably powerful enough to bring the subordinate chiefs under them into the meshes of their influence, and in the absence of a centralised system of government, *Māḍampimār*, Temples and Brahmans

exercised practically all the rights of sovereignty, nominally yielding fealty to some paramount power. There is a tradition recorded in the Kēraḷōlpaṭhy that the actual internal administration of the country was left by the Perumāls with the Brahmans during the Perumāḷ period which lasted for several centuries, the Perumāls confining themselves to the duty of protecting the country from foreign and domestic foes.

“The chiefs, principal and petty, had their own private domains held in absolute proprietary right, and their revenues consisted, besides the produce of their own private jenmom lands, of custom duties on trade, mint duties, escheats of inter-state property, poll-taxes, taxes on professions, a variety of royalties on cardamoms and other indigenous products, the wrecks of vessels stranded on the coast, presents on festival days, and occasional contributions on extraordinary exigencies.

“The exercise by Dēvaswoms and Māḍampis of the rights of sovereignty was, in later times when the whole of Travancore became united in one sovereign, found incompatible with the welfare and progress of the society at large, and the rights and privileges of Māḍampimār and others similarly placed were one by one curtailed in the last and in the beginning of the present century.

“The private jenmom lands of Māḍampimār and of petty Rājas and Chiefs were, in several instances, confiscated by the Sirkar for acts of rebellion and other causes, and so also has been a large extent of lands appertaining to wealthy temples numbering 378, the management of which was assumed by the Sirkar in the year 987 M. E. during the administration of the State by Colonel Munro as Dewan.

“From what has been stated above, it may easily be gathered that the lands must, in ancient days, have been owned by four classes of community, viz.,

(a) The Malabar Brahmans who were the first to occupy the land at least in places where their community had established themselves,

(b) the pagodas or religious institutions founded and endowed by Brahmans and others,

(c) Rājās and local Chieftains, and

(d) Māḍampimār, i.e., Heads of villages.

"All these classes have long regarded the property in land as their own private property and the ruling feature in regard to the tenure of land may be said to be this, that all land is private property of the joint family or other corporation (Illom, Mana, Maṭom, Eḍavaka and Tharawād) and that it is distributed amongst a multitude of proprietors and landlords of various classes and conditions from the Ruler (Rāja), Nobles (Eḍavakas or Swaīṇpams) and religious institutions (Dēvaswoms) with their large estates, Kandukrishi or Thanathu lands tilled by their once predial slaves and tenants-at-will, down to the petty Māḍampimār and Kuḍi-jenmis tilling their own land. The private property in land possessed by these classes has, from ancient times, been distinguished by the word 'Jenmom' derived from Sanskrit and signifying birth-right, that of the subject races belonging to the non-Brahmanical race being also distinguished at later times by the word Kuḍi-jenmom signifying the birth-right of Kudi or subjects. This private property may be said to be the more ancient and probably more perfect than that of English landlords."

Now we shall consider the origin of these jenmom tenures. Many are the theories advanced to explain the origin of jenmom land. The following are the views of some other eminent persons on the subject.

1. *Rāja Sir T. Mādhava Rao's View*:—"A jenmi is often termed a landlord. But, it must be clearly understood that he is a peculiar kind of landlord."

“Any person who holds a pāṭṭah from a Collector in a British District and under it holds lands from the British Government subject to Government tax more or less, is called a landlord in ordinary language. Even in Travancore, any coffee planter or indeed any ryot who holds lands under a grant from the Sirkar, &c., is or may be called a landlord. But be it remembered, such landlords are not jenmis.

“A jenmi differs from such landlords in that he does not derive his title to lands from the Sirkar, &c. His title to the jenmom lands is inherent. He is, so far as his jenmom lands are concerned, a little territorial sovereign in a limited sense. He is landlord of his jenmom domain exactly in the sense in which the Sirkar is landlord of all the land it grants to planters and indeed to all ryots in general; in the sense in which the British Government is landlord of all the Ryotwari lands of the East Coast Districts of the Madras Presidency.

“The origin of jenmom property may be briefly explained here with a view to make the rights of jenmis clear. Kēraḷa Dēśom (in which Travancore is included) was originally conquered by Paraśurāma, and this great warrior parcelled out the conquered lands among a limited number of Brahmans. The Brahmans then became territorial lords, each independent of the rest. From that early age, the lands have descended with the tenure almost unimpaired. The lands so belonging to each Brahman are said to constitute his jenmom, and the Brahman himself is called a jenmi. These lands, so long as they continue in possession of the jenmi, are free of all taxation. To this day this exemption continues in full force.

“Jenmom lands are precisely what are in Europe called allodial properties as contra-distinguished from feudal.

“It must be clear from what has been stated that all the lands in Travancore belong to a body of jenmis. There are no lands that do not belong to some jenmi or other,

"Be it remembered that the Sirkar itself is one of these jenmis, it having come to possess jenmom lands by gift, purchase, escheat, confiscation and other ways. It is only a great jenmi, great in the sense that its jenmom property is extensive.

"If any person wants land in Travancore he must obtain it from, and hold it of, some one of the body of jenmis, i. e., from the Sirkar, which is the chief jenmi, or from some other jenmi".

2. *The Madras Revenue Register**:—The jenmi of the Malayālam country is an absolute free-holder and possesses entire immunity from all taxation on account of his land. This state of things is attributed to an act of the great warrior Paraśurāma.....Thus a jenmi in Malabar differs altogether from the landlords of the rest of the Madras Presidency, who, whether as Zemindars, Mittadars or ryots, hold entirely of the governors.

3. *Dewan Sēshiah Astry's View*:—Jenmom lands may be sub-divided into (1) Lēvaswom, (2) Brahmaswom, i. e., those held by pagodas, and those held by Brahmans. The normal condition of the jenmom tenure is absolute freedom from taxation of any kind and the tenure dates from the remotest period of antiquity. The tenure, however, ceases the moment it passes into alien hands (that is, non-jenmis) for a money consideration, whatever the nature of the transaction. The mere letting out of the lands for annual rent to a tenant for whatever period does not vitiate the tenure. The moment an alienation (Kāṇom or mortgage) does take place, the land becomes liable to a light tax called rājabhōgam amounting in the case of gardens to $\frac{1}{6}$ or $\frac{1}{8}$ of the full rental and in the case of paddy lands to nearly the same proportions of grain rent, i. e., $\frac{1}{2}$, $\frac{3}{10}$ or $\frac{1}{10}$ of the quantity of seed required to sow the land, while the full grain rent would be represented by an average of three times the quantity of seed. Even if the mortgage is

* Vol. IV (1870), page 34.

afterwards redeemed by the jenmi, the tax will continue to be levied from the land. If the mortgagee dies heirless, his rights escheat to the Sirkar. So also if the mortgagee (Kāṇomdār) abandons the land, owing to the land becoming unfit for cultivation, it is at once transferred to the Sirkar and granted by the latter as a Sirkar pāṭṭom tenure.

The Māḍampimār who are generally Nāyars or other non-Brahmans are in common parlance also called jenmis, though, strictly speaking, they are not, because their lands are always subject to rājabhōgam even from the very beginning. These lands also are seldom alienated by absolute sale. If they are so alienated, the tenure is extinguished and the land becomes the property of the Sirkar. The purchase money less a fine of 25 per cent. is given credit for, and interest is allowed on the 75 per cent. only, the balance being added to the existing rājabhōgam tax. On every such alienation this fine of 25 per cent. is levied and ultimately the entire purchase money disappears and interest added to rājabhōgam which absorbs all the rental and may even exceed it.

4. *The late justice Kunjīāman Nayar's View:*—“The term ‘Jenmom’ was originally used by the Brahmans exclusively to denote their allodial proprietorship and is still used in that sense in Courts of Travancore, though in other parts of Kēraḷa and in popular parlance in Travancore the term is now universally employed to denote the full proprietary right in the land of any class of people.

“It has been supposed in some quarters that the jenmom and kāṇom were originally mere offices of rank and did not denote any rights in land, but these novel theories, opposed as they are not only to popular and received notions on the subject but also to the weight of authority of early enquiries into the land tenures on the West Coast, may be disposed of by the simple remark that any one pursuing the jenmom or attippār deeds, (as the deeds of outright sale of jenmom are called) cannot but be struck with the idea that jenmom right contained within itself the full rights

of an allodial proprietor and that the parties had expressly employed words to show how complete the dominion was that had thus been bought and sold.

"The jenmom, signifying birth or life, may not be a very accurate term to express a tenure of land and there is no doubt that originally the term included many territorial, social, taxationary and other incidents which pertain to the jenmiship in the persons families and institutions to which the title with its privileges is attached ; but, for the last 200 or 300 years at all events, the term has been used on the West Coast generally to denote prescriptive hereditary property in the land. The conveyancers in Kēraḷa employ in their conveyances more general words than are to be found in the old English deeds. They profess to sell not only the surface of the soil within defined boundaries but stones, good or bad, stumps of nux vomica, thorns, roots, pits, mounds, treasure, lower earth, water, ores, foot-paths, streams, &c., and these point to an ownership of soil as complete as was ever enjoyed by a freeholder in England.

"Several attippēr deeds in which the fulfilment of the above requirements is recited as a matter of form are to be met with on the Malabar Coast, and we have also come across documents showing the sale of lands, the gift of lands, and the inheritance of lands, all in complete ownership. It is thus clear that the jenmom on the Malabar Coast has long been regarded as the '*plenum dominum*' in the soil and the jenmi as the possessor of that '*plenum dominum*'.

5. *Logan's view*.—According to him jenmom and kēnom were originally political offices, conveying each a right to a definite customary share of the produce; and rights of property in the soil were imperfectly developed even at the time of the Mysorean invasion.

"The unit of the Hindu social system was the family, not the individual. An association of families formed a body corporate or guild. These corporate bodies had each

distinct functions to perform in the body politic, and those functions were in old times strictly hereditary..... The Nāyars were the people of the 'the eye', 'the hand' and 'the order' and it was their duty 'to prevent the rights from being curtailed or suffered to fall into disuse'. The word *kāṇom* comes from the Dravidian word *kāṇuka* (= to see or to be seen) and the root from which that verb is derived is *kaṇ* (=the eye).....so that *kāṇom* in its original sense seems to have denoted this function of theirs in the body politic.....But what was this supervision right (*kāṇom*)? The *kōn* (shepherd, king) and the *pathi* (lord, master) had shares of the produce due to them as the persons of authority in the land. And the specific word used to denote these shares was *pāṭṭom*, signifying the *padu* (=authority's) *vāṛam* (share)..... The Nāyars were no doubt spread over the whole face of the country protecting all rights, suffering none to fall into disuse, and at the same time supervising the cultivation of the land and collecting the *kōn* or king's share of the produce, the public land revenue in fact.

"All the state functionaries employed had well-defined shares of the produce set apart for them. The *kōn* or king had his share. The *pathi* or overlord (the hereditary grantee apparently if there chanced to be one) had likewise a share. And if there was no such *pathi* or hereditary grantee, then it seems his share went to the general body of protectors and supervisors—the 'Six Hundred',—the Nāyar guild, the *kāṇakkār*. . . .

"But when the right of the *Peṛumāl*s came suddenly to an end, their (the *kōn*'s) share of the produce was, in Malabar at least, certainly not passed on to the chieftains who in some measure supplied the *Peṛumāl*'s place..... These chieftains certainly had revenues from their demesne lands, but from the lands of the bulk of those subject to them they certainly levied nothing. The chieftains were hereditary holders (*jenmis*) of the lands from which they

derived a share of the produce, and, on the other hand, the bulk of their subjects—the headmen of the Nāyar protector guild—had likewise become hereditary holders (jenmis) of their own lands by usurping the kōn's share of the produce. This is the only explanation which accounts for the state of the facts at the time of the conquest of Malabar, and, moreover, it is a very natural explanation....

“If the fundamental idea of the Malayāla land tenures is borne in mind, namely, that the land was made over in trust to certain classes for cultivation, the above will be seen to be a most natural outcome of the Hindu system.

“While on the one hand, therefore, it is erroneous to suppose that the jenmi was the dominus, it is equally inaccurate, on the other hand, to say of the kāṇakkār or supervisors that they were the real proprietors of the soil.....The Nāyar kāṇakkār collected the share of the produce due to the jenmi. But jenmis were at times hard pressed for coin and it became customary for them to borrow what money they wanted from the kāṇakkār. In proportion to the sum borrowed the kāṇakkārān deducted from the pāṭtom (i.e., the pādu or authority's vāram or share) collected by him for the jenmi a quantity of produce sufficient to meet the interest on the sum lent. The interest was calculated at certain customary rates and the balance of produce alone went to the jenmi..... What he pledged was evidently not the soil itself but only his share of its produce so far as that went, and after that his other income and emoluments attaching to his status as jenmi of the land. But the civil courts, acting on the idea that the jenmi was a dominus and as such entitled to take what he could get out of the land, viewed his pledges as pledges of the soil itself, and in this way they have almost completely upset the native system of customary sharing of the produce.

“Under that system of customary sharing of the produce, the kāṇakkārān's advance to the jenmi used

to be periodically revised in one or other of two ways, namely :—

(a) A deduction of about thirteen per cent. of the advance was made and a renewal deed showing the loan diminished by this percentage prepared, or

(b) no deduction was made, but instead of it the *kāṇakkāraṇ* made to the *jenmi* a payment equivalent to the customary deduction described in (a) and the renewed deed showed the full original sum advanced.....

“The latter method (b) is that which has generally been adopted, and the periodical renewal fees — now, however, extravagantly enhanced, amounting in the most favourable cases to about twentyfive percent. of the mortgage advance—form one of the regular sources of a *jenmi*’s income. The idea at the root of this system of renewals was that in due course of time the *jenmi*’s customary share of the produce should be freed from the mortgage with mutual advantage both to the *jenmi* and to the *kāṇakkāraṇ*. If, on the other hand, it was to their mutual advantage to maintain the existing relation, the payment made in lieu of the customary deduction was of advantage to both of them. The system was admirably conceived for binding the two classes together in harmonious interdependence When after a series of renewals by the method (a) described above the *jenm* holding had been freed from mortgage, the parties (*jenmi* and *kāṇakkāraṇ*) simply resumed their original stations. The *kāṇakkāraṇ* began to yield up again to the *jenmi* the whole of the *jenmi*’s customary share, as he had been in the habit of doing before the loan had been made, and remained on the holding in his capacity as supervisor (*kāṇakkāraṇ*).”

6. *Sir Charles Turner*:—The late *Sir Charles Turner*, Chief Justice of Madras, after severely criticising this view of Logan and exposing some of his assumptions, proceeds to state;—

"It appears to me impossible to resist the conclusion that, whatever the origin of the title, the jenmis were, and for centuries before British rule had been, the owners of the soil in full proprietary right; and that their rights were recognised even by the class that would have been most hostile to them, the Māppillās, who owing to the persecution of Tippu had for some years been the masters of the situation. Indeed this seems to be admitted by Mr. Logan; for he notices that when the jenmis fled the country, they received considerable advances in money from their Māppilla tenants."

7. *Baden Powel's view*:— Mr. Baden Powel does not accept Mr. Logan's etymologies, but relying on Mr. Logan's history, tries to show that the claim to jenmom right is an instance of the phenomenon common in India, of rājās or chiefs who were originally rulers and claimed only revenue without interfering with the proprietary title of the original soil occupants, gradually, as their rule is weakened by invasion or conquest, assuming the rights of landlords and demanding rent. The early organisation into tharas and nāds, as described by Mr. Logan, is according to him typically Dravidian; and the next stage, the introduction of a king (Kōn, Perumāḷ), to whom a land revenue is assigned, is in accordance with the custom common to Dravidians and Āryans. The petty chiefs, who succeeded the Perumāḷs, claimed no general land revenue and were content with demesnes, feudal services and miscellaneous revenues; but with the Mysorean conquest, a general land revenue was reintroduced, and the petty chiefs became landlords or zamindars in their turn paying revenue. These landlords are called the jenmis.

"The whole process of the growth of the landlord right then reduces itself to an evolutionary process, which in all essentials is the same as that which has taken place in other parts of India",

Criticism. Mr. Baden Powel's theory is built on the conditions supposed to exist in Malabar. But it has to be noted that so far as Travancore is concerned there was neither a Muhammadan conquest nor the British rule. The fact that jenmom and kāṇom tenures exist in Travancore similar to those in Malabar shows that Mr. Baden Powel's theory is not a universal one and does not bear scrutiny. His theory, even as applicable to Malabar, has been severely criticised by Sir Charles Turner.

8. *The Travancore Jenmi and Kuḍiyān Committee's view:*— According to the majority report of this committee which was presided over by the late Justice P. Rāman Thampi, the theory that Paśaśūrāma reclaimed Kēraḷa and peopled it with foreign Brahmans is neither true nor probable. After noticing the fact that 'Chēra' and 'Kēraḷa' are descriptions of the same type and territory, it states: "It requires no argument to prove that the Chēra line of kings held sway over that tribe and those territories". "The jenmom lands of an individual Nampūthiri do not in fact lie in a block or even in the vicinity of his family in the majority of instances. If Paśaśūrāma had made grants he would have seen that each donee should get land situate near his dwelling house or at any rate not beyond his sphere of influence. In fact we see Nampūthiris of Cochin, Malabar and North Travancore claiming jenmom rights over lands in South Travancore. Some of them indeed have no jenmom property near their illom and live upon rents collected from lands in the far far south. This fact is inconsistent with the theory of mythical gift".

"Several old Malayāḷam writings corroborate the assertion that 'Nākās' were rulers of Malabar. Sahyādrikhaṇḍom calls 'Nākās' or Nāyakās Śūdra Rājas and describes Malabar as the land 'where thrive Śūdra kings called Nāyakās, who give away to suppliants all their wealth'. After stating that many Māḍampis (non-Brahman chiefs) held lands in various places within Malabar, it states: "What is

important in this connection is the fact that Nampūthirīs and Pōttis who claim absolute ownership of all landed property in Malabar have nevertheless allowed centuries to roll away without asserting or exercising a semblance of title to lands which were dealt with and controlled by Nāyar chiefs called Sāmanthas, Māḍampis or Nāḍuvālis. It cannot therefore be that these chiefs had no ownership of land. Many of them are even to-day full proprietors of 'thanathu' holdings. In North Malabar there are more numerous Nāyar jenmis than Nampūthirī jenmis. There are several taluks in Travancore where jenmion property of Nampūthirīs is more the exception than the rule".

The report continues: "The Nāyars have been from time immemorial large landed proprietors. It is also clear that several Nampūthirīs have ousted the Nāyar class. When the numberless principalities and chieftainships which fought against one another were conquered by Travancore and annexed to that State, the holders of land in several of them became doubtful whether individual rights would be recognised by their new king. They felt confident, however, that peculiar sanctity was always attached to devaswoms and brahmaswoms. With the object of thus securing vested rights of property, many landholders accepted kāṇappāṭṭom deeds from Nampūthirīs and devaswoms, for lands which in fact did not belong to the latter. The process of commendatio was further accelerated by the severity and rigour of the Sirkar revenue officers entrusted with the duty of tax collection. Private holdings were always chargeable with land-tax. So too were Māḍampivaka lands, though the taxation thereof was comparatively light. But devaswom and brahmaswom lands were either tax free or were only taxed when alienated for consideration. When the settlement officer or tax collector of olden days demanded tax and threatened the use of coercive measures, the landholder could easily save himself by acknowledging the title of some jenmi and posing as the latter's lessee. That commendation

owing to various causes, was largely in vogue at one stage in the history of Travancore land tenures is emphatically asserted by unbiassed witnesses and is inferable from ascertained facts. Apart from the ordinary demands of land tax, the Sirkar was often constrained to levy extra cesses on emergent occasions. One of such occasions was the war with Tippu Sultan. Throughout the country *Nilavāri* and *Rūpavāri* were imposed. Numerous landholders surrendered their lands to the Sirkar. Others had to alienate or encumber their holdings In these circumstances it would not be surprising if individual landholders or the collective body of landholders in any local areas chose to attorn to influential jenmis in order to defraud the State. It is admitted that the Māḍampis and Eṭṭuvittil Pillamār, who rebelled against Mārthāṇḍa Varma, paid heavily for their sins. Their lands were confiscated.....Confiscation of Māḍampivaka lands did not always result in their reversion to the State. Several of such lands were transferred to brahmaswom and devaswoms. What Māḍampis lost, the other jenmis gained."

"There is also evidence to show that the Sirkar made gifts of land to Nāmpūthiris". (Instances are given in the Land Revenue Manual, etc.).

"It is evident from the above that various circumstances contributed to the impoverishment and spoliation of the Nāyar class of jenmis and the proportionate enrichment and aggrandisement of the Nampūthiri class", which explains the position of the Nampūthiri jenmis of devaswoms and devaswom or brahmaswom 'jenmom' lands.

Whatever be the origin of the jenmom lands, it is evident that Jenmom property is the
 Conclusion. absolute private property of the owner or proprietor. Generally they are tax free. There was, however, a light assessment called *rājabhōgam* on lands belonging to non-Brahman jenmis.

The jenmom lands may be divided into three classes:—

1. Lands that are entirely freehold and exempt from payment of any kind of tax to government under any circumstances, called 'Freehold'.

2. Lands originally exempt from payment of tax but subsequently becoming liable under certain conditions.

3. Lands paying rājabhōgam or a light tax from the very beginning.

Under the first class are comprised :—

(1) The two adhikāraṁs or prowerthis of Āttingal and Eḍakkōḍu belonging to Śrīpādam or Her Highness the Rāṇi.

(2) The Kiḷimānūr Adhikāraṁ belonging to the Kōil Thampurān.

(3) The dēśoms of the Eḍappallī Rāja outside Eḍappallī proper or Eḍappallī Eḍavakay—Changanāśśēry, Kārthikappallī and Thiruvalla.

(4) The dēśoms of the Pūnjāt Perumāḷ (Mīnachil).

(5) The dēśoms attached to Maṇikanṭhēswaram Pagoda (Kotṭāraḱara taluk).

(6) The dēśom attached to Eḷamkunnappan Pagoda (Paṭhanāpuram).

(7) The dēśoms attached to Kaviyūr Pagoda (Thiruvalla).

(8) The dēśoms attached to Pāngōṭṭu Krishṇa-swāmy Pagoda (Kotṭāraḱara).

(9) The dēśoms attached to Maṇṇaḍy Bhagavathi (Kunnathūr and Paṭhanāpuram).

(10) The dēśoms attached to Panayannār Kāvil Bhagavathi (Thiruvalla).

(11) The dēśoms attached to Kongurpallī Nampūthiripād's Śāsta and Bhagavathi (Changanāśśēry).

(12) The dēśoms belonging to Akavūr Nampūthiripād (Kotṭāraḱara, Kārthikappallī and Māvēlikkaṛa).

(13) The *dēsoms* attached to Akavūr and Ūmam-pally Nampūthiripāds (Quilon).

(14) The *dēsoms* belonging to Vaññippula Paṇḍā-raṭhil (Chengannūr).

In the Sirkar revenue accounts they are termed *Adhikāram Oḷivu* and *Dēśa Oḷivu*. They consist of compact blocks of territory and are absolutely exempt from tax of any kind and from all government interference in the matter of revenue administration.

The peculiarity of this last class of *jenmom* properties is that their owners have absolute control over them in connection with their revenue and rents and they take from the *ryots* the *pāṭṭom* or rent as well as the *rājabhōgam* which in the case of other lands would go to the State. That is, the full *pāṭṭom* or a portion of it is taken according as the land is *pāṭṭom* or *otti*, while the *dēvaswom* and *brahmaswom* lands in these tracts pay their *rājabhōgam* or quit rent to these chiefs instead of to the Sirkar. These tenures are in no way developments of the original *jenmom* proper but are of the nature of pure *jenmom* or freehold properties and had their origin in the gifts and cessions made by the former *rājas* and chiefs.

Under the second class are comprised :—

1. *Dēvaswom* or pagoda properties,
2. *Brahmaswom* or holdings of Malayāḷi Brah-mans. The peculiarities of this kind of lands are :—

i. That in their normal condition such lands are absolutely exempt from taxation.

ii. That this condition ceases the moment the land passes into the hands of those other than *dēvaswom* or Brahman *jenmis* for a money consideration, though the mere letting out for a rent will not affect the tenure.

iii. That on such alienation the lands become liable to a light tax called *rājabhōgam* which is apparently a fee paid by the tenant in acknowledgment of sovereignty.

iv. That the property so taxed becomes subject to escheat and is then taken up by the Sirkar if the tenant should die heirless; all that the jenmi could thereafter claim being only his micchavāram; and

v. that if the land be abandoned as nirṭhal or unfit for cultivation, it is taken up by the Sirkar and dealt with as Sirkar pāṭṭom lands.

Under the third class fall the holdings of various chiefs and others including Māḍampimār as shown below:—

- (1) Perumpaḍappu Swarūpam (Cochin Mahārāja).
- (2) Kōduṇṇullūr Rāja,
- (3) Pūṇṇāt Perumāl,
- (4) Paṇḍārāthummār,
- (5) Thampākkamār, Thirumulpāḍamār and Kōvilanmār.
- (6) Pāliathu Mēnon,
- (7) Vaḍayāttu Chief,
- (8) Native Māḍampimār,
- (9) Foreign Māḍampimār,
- (10) Nāickamār,
- (11) Vārianmār.

The peculiarities of this kind of lands are:—

1. The lands are subject to rājabhōgam from the very beginning.

2. The tenure holds good as long as the land is not alienated by sale, and

3. if an absolute sale takes place, the tenure is extinguished and the land is treated as an otti holding.

The jenmis created various kinds of subordinate tenures under them from a simple lease (verumpāṭṭom) to

outright sale (aṭṭippēr). The most important and prominent among such tenures is the kāṇappāṭṭom tenure. A kāṇappāṭṭom is a combination of a lease and mortgage-lease which

Origin of 'Kāṇa-
pāṭṭom' tenure.

entitles the jenmi landlord to rent, and mortgage which entitles the kuḍiyān mortgagee to so much of the usufruct as is equal in value to the interest on the sum advanced by him as artthom. Whether it is a lease or mortgage or a combination of the two, the law has declared that it is not redeemable, resumable or determinable save in exceptional circumstances. In this respect it differs from tenures of the same kind in Malabar and Cochin. It is periodically renewable on payment of a certain percentage of the mortgage amount. The kuḍiyān enjoys the usufruct of the property demised, reserves a portion thereof in lieu of interest on his artthom, pays another portion as net rent or residual rent to jenmi, pays Sirkar assessment, if any, and pays renewal fees and the produce of the land. Before going into the further details of the transaction, the origin of these tenures has to be considered.

The Jenmi and Kuḍiyān Committee's view:—According to the majority report of that committee, kāṇom tenure had a military origin. The Nampūthiṛis became the lords of the soil, the Nāyars contenting themselves with allotments to be held of the chiefs of feudal or military service tenures. “Thus the chieftain families of the Nāyars and sacerdotal families of the Nampūthiṛis became jenmi owners of the landlords of the country with dominion over inferior races. Grants.....and leases became common. The grants were mostly made to inferior chiefs or captains of the Nāyar militia to be held by them in military subordination. The main body of the Nāyars chose to get household or family allotments in lease from their several captains and chiefs on payment of a fee or Nazarana called Kāṇom or Kāṇike in token of allegiance, but paid no rent and were only bound to military service. They did not till the land themselves, but cultivated it through slaves or serfs. In order to secure their independence, these military Nāyars asserted the power of demanding back the Nazarana, relinquishing the land and transferring

their allegiance to another chief. But the chief appears to have had no corresponding liberty to take away the land or terminate the lease. The bulk of the occupied land was thus granted away on *kāṇom* by the Nāyar chiefs".

The Nampūthīrī chiefs followed their example finding such a course necessary for their own protection. The private demesne of the chief or the Nampūthīrī was cultivated through low-caste slaves or serfs or leased on *pāṭṭom* tenure to ordinary rent-paying tenants of the non-military classes. Thus were formed the Brahman *dēsoms* and the Nāyar *tharas*. The superimposition of an imperial authority necessitated the assignation of a share of the rent or produce as its due. When this authority disappeared, the strong *jenmi* exacted this tax or part thereof as rent. The imperial authority had little concern with affairs relating to land and was always held in check by territorial assemblies or councils of the Six Hundred, etc. The *kāṇom* which in its inception was a perpetual lease changed services as soldiers became less necessary with the advent of peaceful and settled times. The *jenmis* started the theory that the *kāṇakkāran's* right to demand back his fee and relinquish the land implied the *jenmi's* correlative right to eject or redeem the *kāṇakkāran*. The theory was not enforced in practice against old *kāṇakkār*, but when once it gained currency, the *jenmi* was enabled to renew the leases periodically on receipt of additional fees, pressure being first brought to bear on the weaker *kāṇakkār* under threats of ousting them. The British rule strengthened the *jenmi's* pretensions and the theory became applicable to all *kāṇakkār*. Outright sales by the original *jenmis* increased the number of small *jenmom* holdings.

Later on the oppressive exactions of the revenue officers as well as the heavy imports resorted to in times of war and other emergencies induced the peasants to abandon

their holdings or attorn to brahmaswoms and dēvaswoms. To the credit of jenmis as a class it must be said that they seldom or never rack-rented tenants. The jenmis, the tenants and the Sirkar conscientiously admitted, believed and acquiesced in the permanency of kāṇom tenures. The kāṇappāṭṭom tenure in its inception was irrevocable. But the refinements and technicalities of English Law relating to mortgages and leases influenced the decisions of courts when called upon to deal with kāṇappāṭṭom. The judges versed in English Law failed to appreciate the bearing of the past history and social organisation of Malabar on the custom which regulated kāṇappāṭṭom. But in Travancore the principle of the irredeemability was always respected and protected by the Government, the rulers taking deep interest in the matter. The royal edicts of 1105 and 1107 M. E., the Proclamation of 1042 and the Regulation of 1071 M. E. fully bear this out. The Regulation now in force was passed in 1108.

Sir T. Mādhava Rao's view:—“When the great conqueror parcelled out the territory among the Brahmans, the number of Brahman families was not large and the possessions of each of those families were considerable in extent. The head of the family was thus a territorial sovereign. A sovereign should not sell his lands; it was a point of honour with the Brahman owners never to sell the lands except under an overwhelming necessity. So the two disintegrating causes of division and sale were absent. Most of the lands of these jenmis were uncultivated waste.

“Now, what was each jenmi to do with such considerable extent of lands? He could not possibly cultivate them himself. He was himself devoted to religious duties and was otherwise unfit to carry on agricultural operations. The only way of turning them to account was to get others, i.e., the Śūdras and people of other castes to cultivate for him. For some time, therefore, their cultivation was carried on in this manner. But the system could not work well without

efficient supervision, which the jenmi could not afford to give. The people employed on the cultivation handed to the jenmi but a poor out-turn. A better arrangement was therefore devised. The jenmi granted a lease of the lands, stipulating for a fixed rent in kind. Thus arose the system of leasing out lands. But it must have been seen that nobody would take up waste lands requiring capital to reclaim unless the requisite capital was advanced to them. Probably this was advanced to some extent on condition that the cultivator paid a certain rent calculated upon the lands reclaimed with the capital advanced. It would still be a lease.

“But the jenmi could not go on advancing capital. Instead therefore of himself advancing the capital required, he would allow the tenant to spend that capital from his own pocket and allow him to make a corresponding abatement in the rent. Reduced to writing, the transaction would appear as if the tenants had made a loan to the jenmi on condition that the jenmi would allow the interest on it to be deducted from the rent payable by the tenant. This, in fact, is *kāṇappāṭṭom* tenure”.

Strictly speaking, this tenure at the stage we are considering was still a lease, subject to withdrawal on repayment of the loan. But in consequence chiefly of the difficulty of the jenmi to repay the loan there was a growing tendency for these leases to become perpetual in practice. Nor would the tenant think of provoking the jenmi to withdraw the lease. He would be generally conciliatory in his attitude towards the jenmi by being always ready to oblige him with loans, &c.

It is easy to conceive that under such a state of things the tenure by degrees became a perpetual one. The same tenant and his heirs were allowed to hold the lands for generations, and the longer they were in possession, the stronger became the motive on the part of both parties to continue the arrangement undisturbed.

No doubt this theory is plausible to some extent. In cases in which the lands demised had already been brought under cultivation and were not wastes, this theory might not apply, particularly in the case of paddy lands which require no improvement ordinarily, and nothing is generally claimed or allowed in respect of compensation for improvement.

Kunjuṛāman Nāyar's view.—The *dēvaswom* *jenmis*, as might be expected from their position, did not, as a rule, cultivate their lands, and the bulk of Brahman *jenmis* were also adverse to taking part in cultivation. They let wet lands to *Śūdras* and others on *verumpāṭṭom*, a bare or simple lease which is supposed to be a tenancy-at-will, or on a lease in which the tenant is required to deposit in advance a sum equal to a year's or two years' *pāṭṭom* (rent). Waste lands they let out on improving leases (*kuḷikkāṇam*, *karikkūr pāṭṭom*, &c.) and when the trees planted by tenants begin to bear fruit, they proceed to assess rent or *pāṭṭom* on the produce of such trees, allowing the tenant the cost of his labor either by a deduction from the gross rent or, in some cases, by creating a charge on the land for the money actually found due to the tenant as compensation for his improvements. Forest lands cultivated with paddy periodically used to be let out on the understanding that at the harvest time the tenant should go to the *jenmi* with presents, reap the crops in the presence of an agent of the *jenmi* and divide the produce between him and the *jenmi*.

The most approved method in the case of fully cultivated lands was by receiving in advance a sum of money as security for rent. Interest at the usual market rate was allowed to the tenant (*kuḍiyān*) on this advance and the balance rent or *pāṭṭom* was to be paid over to the *jenmi*. This advance or deposit by the tenant was called *kāṇom*. The documents evidencing the arrangement went originally in North Travancore by the names of *Pāṭṭa Ōla*, *Uḷavu Pāṭṭom*, *Uḷavu Ōla*, *Ubhayappāṭṭom*, &c., and in South

Travancore by the name of *Mārāyappāṭṭom*, terms signifying that the main object was to let lands for cultivation.

The tenants who furnished the security for rent at a time when money was scarce were very liberally treated by the proprietors. The same rate of rent was not exacted from them as from the *verumpāṭṭakkār* or simple lessees who had not made any advance, and they were not changed without good reasons. In the old days it was difficult to get tenants who would undertake to farm lands after depositing proper security, though the necessity for demanding such security in the then condition of the country was self-evident. For many centuries the central authority was weak and each *Nāḍu* or division of the country was from time to time involved in war with the others. A tenant could escape without much difficulty into a neighbouring state, when it would be difficult, if not impossible, for the landlord to follow him and exact his dues.

The lease with security, as opposed to a bare lease, came in course of time to be styled in common parlance as *kāṇappāṭṭom* to distinguish it from *verumpāṭṭom*, although the documents evidencing the lease went in different places under the more ancient names of *Pāṭṭa Ōla*, *Uḷavu Ōla*, *Mārāyappāṭṭom* and *Paṇayappāṭṭom*.

The proprietors further raised loans on the security of lands as their necessities increased. In South Travancore, the bulk of the lands owned by Brahman landlords was, at an early period, transferred on *otti* (mortgage). In North Travancore also, some of the needy landlords transferred their lands on what was there colloquially known as *paṇayam*.

Neither the mortgage nor the lease with security was considered as conferring a permanent right of occupancy on the tenant beyond the period expressly or impliedly fixed in the documents. Wherever the landlords desired to confer permanent rights of occupancy upon their tenants, they did so by granting other tenures. To their servants, vassals or dependants, they gave lands on *Aḍima*, *Anubhōgam*,

Thiruvuḷam, Thiruvaḍayāḷam, etc. To strangers they gave lands on Ira kārāṇma, Nēr kārāṇma, Vecchupāthi kārāṇma, Mārappāṭṭom, Miḷā otti, etc., the last two terms signifying a pāṭṭom or tenancy which could not be changed and a mortgage which could not be redeemed respectively. The existence of these tenures puts it beyond all doubt that the ordinary kāṇom, otti and paṇayam are resumable or redeemable.

The right of distraint for arrears does not appear to have been ever exercised by the jenmis. They had a security for the arrears and they seldom found it necessary in ancient days, when they could eject their tenants at their pleasure, to exercise this right. When a tenant fell in desperate arrears of his rent to the jenmi, the latter transferred possession to a new temporary tenant who undertook to pay them upon the distinct understanding that on the old tenant coming forward to reimburse the temporary occupant the latter should restore the land to the former. This arrangement was known as "Patukalam". It may be asked why if the kāṇom tenant had no rights of occupancy the jenmi should have been so solicitous to enter into the Patukalam arrangement above described. The answer is to be sought in the general characteristic or tendency of the life of a Nampūthiri Brahman of ancient days and his feeling which was eminently lax and elastic. He was not in the habit of strictly exercising rights or enforcing obligations and he acted in adaptation to the exigency or convenience of the moment.

Besides these theories, it has also been established that kāṇappāṭṭom arose out of contracts pure and simple between the jenmi and the kuḍiyān, i.e., the jenmi borrowing money from the kuḍiyān on the agreement to execute a kāṇappāṭṭom, though the majority of such instances are of modern times.*

* T. Kunjūśaman Nayar : Memo on Land Tenures,

Kāṇappāṭṭom, as already noticed, is a tenure, by whatever terms known, under which the rent due is secured by an advance and the advance is treated as a charge on the land carrying interest. Originally the kāṇappāṭṭom lease was to run only for a period of three years, but subsequently it was extended to twelve years.

The main features of kāṇappāṭṭom. The rate of kāṇom on each *para* of land or garden was not uniform. Nor does there appear to have been any principle on which it was levied. The jenmis took what sum they could persuade or compel their tenants to part with. In North Travancore the rate was slightly less than in South Travancore. This was probably due to the fact that in South Travancore the kāṇappāṭṭoms, as at present, were mostly usufructuary mortgages. There was an established division of produce between the jenmi and the cultivator, but this share was not uniform throughout the State. The productiveness of the soil, the amount of pāṭṭom on the adjoining lands, and the amount advanced were all taken into consideration in assessing the jenmippāṭṭom.

The payments made by the kuḍiyān (tenant) to the jenmi (landlord) fell under three heads :—(1) Annual, (2) occasional, and (3) once in twelve years. The annual payment consisted of (a) micchavāṛam or rent fixed by the deed, and (b) ōṇakkāḷcha or ulsavakkōppu, i.e., present by the kuḍiyān at the time of the Ōṇam festival or, if the jenmi happened to be a dēvaswom, at the time of the annual festival in the temple. Sometimes in the case of garden lands Panchaphalam (five fruits, i.e., jack, coconut, arecanut, plantain, etc.), was also levied. The tenant was bound to pay these dues in time, failing which interest was charged. The jenmi could also reimburse himself out of the kāṇom amount.

The chief among the occasional payments are the Āraḍiyanthirām fees (Ārukāḷcha) and the Kalaśavari (when the jenmi is a dēvaswom). The Āraḍiyanthirām fees are

contributions made by the tenant on the occasions of six important ceremonies in the Nampūthiri jenmi's household. The ceremonies are (i) *Chōrūṇu* or initial rice-giving to a child, (ii) *Upanayanam* or investing with the Brahmanical thread, (iii) *Samāvartṭhanam* or the completion of the student period, (iv) *Vīli* or marriage, (v) *Piṇḍam* or ceremonies connected with the funerals of the eldest male member, and (vi) *Māsam* or ceremony connected with the first anniversary of the death of the eldest male member. Kalaśavaṛi is the fee levied by dēvaswom jenmis when kalaśams or purificatory ceremonies take place in the dēvaswoms. The amount of such occasional fees varies in different localities and is often governed by the special customs of each family. It often comes to 15-20 per cent. of the micchavāṛam. Sometimes the payment is in kind rather than in money. These dues had their origin in the voluntary payments made by the tenants as a token of fealty on ceremonial occasions. A non-Nampūthiri is not entitled to claim these fees and if a Nampūthiri jenmi alienates the jenmnom land, his non-Brahman assignee also cannot recover them.

The periodical fee is called the Aḍukkuvathu or renewal fees payable ordinarily once in twelve years. The reasons which induced the jenmis to grant and the kuḍiyāns to accept a renewal have been mentioned already. The idea of renewal had probably its origin in the popular notion that muniments of title created in one reign or administration were not respected unless the successor also recognised it and, therefore, had to be renewed in the succeeding administration. This takes us back to a very primitive state of society when the conqueror acquired not only the public rights of the conquered king but also the private rights of the defeated king's subjects. As the jenmis were a kind of feudal lords, the principle of the renewal on a change of the political administration was extended to private individuals. They insisted upon the tenants renewing their documents on the death of every head of the jenmi's family. The deeds

had, of course, to be renewed on the termination of the period fixed in them. And on all these occasions the tenant had to pay certain fees to the jenmi. This was hardly fair to the tenant. As rights to property came to be more and more respected, the injustice of too frequent renewals was greatly felt, especially if there happened to be a succession of deaths in the jenmi's family. The practice thus arose of renewing these deeds only after the termination of the period fixed in them.

For the privilege of being allowed to remain in possession of the land for another period, the jenmis insisted upon their tenants remitting a fixed percentage of the *kāṇom* amount. The amount so remitted was known as *Avakāśam*. The reduction being made at each renewal, the *kāṇappāṭṭom* was being gradually redeemed. It was probably to prevent this automatic redemption that the renewal fee or *Aḍukkuvathu* was devised. This fee, being a substitute for the reduction of the family debt, went into the family exchequer. Some think that the term *Aḍukkuvathu* is a corruption of "*Aḍukkummuthel*" or money enabling one to approach another. This is due to the popular notion that no inferior can approach his superior without a present or *nuzzur*. But this explanation does not appear to be quite satisfactory. The term is a corruption of "*Aḍukkuvathu*" or that which is appropriated or taken by the jenmi. It will be remembered that at each renewal the jenmi took or appropriated a portion of the *kāṇom* in consideration of the renewal, and this fee was intended as a substitute for the amount so appropriated. It has been held by the Travancore High Court that *Aḍukkuvathu* fees were "the means by which the jenmis appropriated what share they could of the improved condition of their lands and which is regarded as a premium for the renewal of the lease, such renewal having been at one time optional with the jenmis".*

* A. S. 200 of 1075.

Another fee which the kuḍiyān had to pay once in twelve years was called Ōlappaṇam. Before the introduction of stamp paper, the documents executed by parties were engrossed on cadjans. The jenmis as territorial lords had their own accountants whose duty it was to write the jenmi's accounts and, during the periods of renewal, to prepare the deeds to be executed by the jenmis. The accountants attested the documents and generally had to do everything in connection with their execution by the jenmi. For writing the jenmi's accounts, the accountant was generally given some property on favourable terms. But the additional work during times of renewal was remunerated by each kuḍiyān paying the accountant a small sum towards the expenses, etc., in connection with the preparation of the deed. This fee was known as Ōlappaṇam or the price of the cadjan.

After the deed was prepared by the accountant it had to be executed by the jenmi. The jenmi claimed a small fee for himself for signing the deed. The Aḍukkuvathu having to be paid to the family is probably the reason why the jenmi claimed a fee for himself for signing the deed. This fee was called Opputhūsi (*oppu* meaning signature, and *thūsi* the needle or style with which the signature was made on the cadjan). It was also called Oppukāṇom or Thūśik-kāṇom.

It has been laid down in a large number of rulings that Ōlappaṇam and Opputhūsi denote the same kind of fee and, therefore, a jenmi cannot, in the absence of express contract, claim both of them. The ground of the decisions was that both these fees were originally intended to meet the expense of the execution of the renewal deed. It will be seen, however, from the preceding parās that these fees, though payable on the same occasion, were distinct in their origin and were due to different people. It may be that Ōlappaṇam or the fee paid to the accountant came to be

paid in later times to the jenmi along with Opputhūsi and that the jenmi did not pay the accountant his share. The accountant, being a servant of the jenmi, was not always prepared to press his claims and thus both these fees came in course of time to be appropriated by the jenmi and to be regarded by him as due to himself.

At the time of the renewal the jenmis had the right of readjusting the terms of the tenancy and enhancing the micchavāram. This was effected in various ways. The jenmis might insist upon an enhancement of the jenmippāttam or they might refuse to pay interest on the kāṇom amount at a rate higher than the one prevailing in the locality, in either of which cases there would be an increase in the micchavāram payable to the jenmi. In North Travancore either of these modes was employed to enhance the micchavāram. In South Travancore the jenmi, instead of seeking an increase in the annual payments, was generally satisfied with obtaining an additional kāṇom called Ēttartham from the tenant. Ēttartham is nothing more than the capitalised value of micchavāram. Similarly, the tenant or kuḍiyān might plead for reduction of micchavāram on account of the nonproductiveness of the soil, etc.

The other rights of the jenmis are :—

(a) The jenmi, being the owner of the soil of the holding, was entitled to everything standing or growing thereon. The tenant was entitled only to a share of the value of the improvements made by him.

(b) The jenmi was entitled to redeem the lease at the end of the term. But subsequently this right was exercised only in exceptional cases, e.g., if the tenant denied his jenmi's title or committed waste or allowed micchavāram exceeding the amount of the kāṇom to fall into arrears. In all cases of eviction, the kuḍiyān was entitled to be paid the value of the improvements made by him.

(c) The jenmi enjoyed a reasonable right of veto against the transfer of a portion of the holding by the tenant.

(d) If the tenant himself offered to surrender his holding, he had to forfeit a fixed percentage of the *kāṇom* amount, but the *jenmi* was bound to accept the surrender and pay for the improvements.

(e) Instead of redeeming at the end of the term, the *jenmis* used to renew the deeds if the *kuḍiyāns* paid a fee for such renewal. At the time of renewals the right of the *jenmi* to revise and readjust the terms of the tenancy was fully admitted and freely exercised.

The *kuḍiyān's* rights were:—

- (a) A right to enjoy the land for twelve years.
- (b) A right to sell, mortgage or otherwise alienate his interest in the holding and, with the *jenmi's* consent, a right to sell his interest in a portion of the holding.
- (c) A right to make improvements suitable to the holding and to be compensated therefor at the time of eviction.
- (d) A right to compel the *jenmi* to accept surrender of the holding; and
- (e) a right to cut down the branches of trees and trees not yielding valuable timber for fuel or for other domestic purposes.

The *kuḍiyān* was bound—

- (a) to pay *micchavāram*, renewal fees and other customary dues;
- (b) to report to the *jenmi* any invasion of his right by third parties; and
- (c) to share the value of the improvements with the *jenmi* at the time of eviction or surrender.

The *jenmis* and the *kuḍiyāns* generally exercised their respective rights without prejudice to each other. So long as the relations between the parties were smooth and cordial, as they admittedly were for a very long time, the absence of Regulations defining their rights was not felt

to be a hardship. This happy circumstance was due to the social and political organisation of the country. The rich land-owners were feudal lords. The various classes of tenants who held the jenmi's lands were his vassals and looked to him for protection from foreign and domestic foes. The Brahmans, on account of their position as land-owners, religious teachers and acknowledged leaders of the country, were looked up to by the other communities and they, in their turn, used their position and influence generally to the advantage of their tenants and dependants. That the Brahman landlords as a class have not changed their sentiments with the change in the times is well-known. But the tenants have, unlike the jenmis, been affected by the progress of western civilisation. The monopoly in land and a sense of insecurity on account of the jenmi's right of eviction thus became causes of complaint by the cultivating peasants. The steady increase of population and the absence of any other profession except agriculture led to more and more persons becoming dependent on land for their subsistence. The jenmis having no source of income except their lands were compelled to exact as much as they could from their tenants and this only increased the discontent. The great demand for cultivable lands helped the jenmi to let his lands to the highest bidder. In South Travancore the bulk of the lands was, as already stated, in the possession of mortgagees. It has also been stated that the interest on the mortgage amount was almost equal to the jenmippāttom and that consequently the micchavāram due to the jenmi was small. But the increase in the value of the land gave the jenmis their opportunity. They began to demand from their tenants larger sums as advances and larger rents. If a tenant failed to comply with the jenmi's demand, he was promptly turned out of his holding. This led to serious discontent among the agricultural classes and complaints were made to the Government. To allay the discontent, a communication containing the commands of H. H. the Mahārāja

was sent to the Appeal Court on the 25th Vrischikam 1005. In describing the practice of the time, the communication stated that the 'jenmis are in the habit of recovering their dues' on specified occasions 'and of allowing the tenants to go on undisturbed' and that 'such is the custom established and this custom is ancient'. It also set forth that the jenmis, contrary to custom, were ousting their tenants and directed 'that in respect of all suits of this nature (for eviction) decided, filed or which may hereafter be preferred, the courts do maintain the established usage in the country, viz., that the tenant should pay the jenmi his usual ordinary and extraordinary dues, and that the jenmi receive the same and let the tenant remain in possession and enjoyment of the property'.

This restored amicable relationship between jenmis and tenants for a time. But in less than forty years, discontent again manifested itself. The provisions of the Royal Command of 1005 M. E. were found to be inadequate. They were probably not being strictly enforced; for we find that the courts in many cases decreed eviction. The discontent became so acute that the Dewan (Sir T. Mādhava Rao) wrote:— "In Travancore there has been from time immemorial a class of large landed proprietors called jenmis. Their lands have been largely alienated on what is called Kāṇappāṭṭom tenure. Under this tenure the ryots have been holding the jenmom lands of the jenmis subject to a rent to the landlord (jenmi) abated to the extent of the interest alienated by him. Under this tenure thousands of ryots have been occupying lands for generations, building houses and churches, carrying out various improvements and in short looking upon their tenures as of a permanent character. An important question has now been raised and pressed by the jenmis, it being whether they have not the right to eject the tenant on repayment of the consideration received at the time of the original lease.....The question is of vital importance to agricultural prosperity and is

engaging attention with a view to an early, final and equitable settlement".*

The advocates of the tenant's rights relied upon the following circumstances to support their contentions:—

(i) The tenants were seldom changed; this practice was tantamount to a recognition of the tenant's right to be in possession for ever.

(ii) As soon as a jenmi alienated on *kāṇappāṭṭom*, the Sirkar assessed the land to revenue and this remained for ever a burden on the property. If the tenure was a redeemable one, the tenant could have been freed from the burden by refusing to take a renewal. Irredeemability made the payment virtually compulsory.

(iii) The tenants sold their rights without previously consulting the jenmi and the jenmi usually allowed the purchaser to attorn to him on payment of a small fee. The sale of the *kuḍiyān's* rights was for sums larger than the *kāṇom* and equal to the market value of the lands. If the lands were redeemable and the tenant was entitled only to the *kāṇom* and the value of improvements, the excess in the value of the land should go to the jenmi. But it was found that even though a sale of the *kuḍiyān's* rights took place with the jenmi's knowledge, he refrained from asserting his rights to get the increased value. This is inexplicable except on the supposition that the tenure was irredeemable.

(iv) Another circumstance relied on to show the irredeemability of the tenure was the practice followed by the Sirkar on the death of a *kuḍiyān* without heirs. The Sirkar took the property and gave it on *pandārappāṭṭom* to some tenant at the full *pāṭṭom* rate. The new tenant was directed to pay the jenmi the annual *micchavāram* and the balance of the *pāṭṭom* was to be paid to the Sirkar as tax. If the tenure was redeemable, the action of the Sirkar was wrong. But the jenmis do not seem to have objected to this

* Administration Report of Travancore for 1941 M.E.

procedure, thus leaving it to be inferred that they had no right to do so.

(v) Again, when a tenant fell hopelessly into arrears, the jenmi transferred possession of the land to a temporary tenant who undertook to pay the jenmi the arrears due to him. But the new tenant was let into possession on the distinct understanding that on the old tenant reimbursing the temporary occupant the latter should restore the land to the former. The old tenant's right to get back the land cannot be explained except on the supposition that he was a permanent tenant.

(vi) The holders of land under this tenure assumed and derived family names from their holdings.

(vii) Certain social, distinctive appellations and honours conferred by the Sirkar designated them also in reference to these holdings.

(viii) The property was registered in the Sirkar accounts in the name of the tenant. The pathivu or pāṭṭa was also given to him. This did not happen if the tenure was only a redeemable mortgage or lease.

These facts were almost all of them admitted by the jenmis but they challenged the conclusions and resisted the demands made by the tenants. Their reply to the above contentions was more or less as follows. The Royal Command of 1005, in laying down the practice of those ancient days, said that the jenmis were in the habit of receiving their dues on specified occasions and allowing the tenants to go on undisturbed. It did not negative the existence of the jenmi's claim to enforce that right. The relationship of landlord and tenant being admitted, and the origin of the tenancy in almost all instances as well as the ancient laws prescribing the forms and words of each particular deed being known, there could not possibly be any acquisition of a prescriptive right adverse to the landlord. The enquiries of the Jenmi Commission have revealed the fact that in North Travancore many jenmis were constantly evicting

their tenants.* The second ground mentioned above is also inconclusive. The Government, in exchange for the protection it afforded, was entitled to call upon each and every owner of land to contribute to its support. It is the respect paid by the sovereigns of this State to the teachings of the ancient Rishis that has exempted the lands of the jenmis from taxation. Seeing that these favoured proprietors contribute little or nothing to the maintenance of the State, this refusal of the Government is justifiable, but it does not show that all the tenures created by the jenmis for a money consideration are irredeemable. The third circumstance is more favourable to the kuḍiyān than the two preceding ones. But in the deed given to the new tenant the amount of the old debt alone was mentioned, though the sale might have been for larger sums. And the attornment fee paid in addition to the renewal fees was really a bribe to the jenmi not to exercise his right of ouster but, on the other hand, to continue the purchaser as tenant. The payment of the attornment fee shows the existence of, and the willingness to exercise, the right of ouster. The fourth ground has been condemned from very ancient times by the courts and it has also been held that a jenmi is not bound by such acts of the Sirkar. The fifth circumstance too is attributable to the dislike of the jenmi for anything new. The fault is not peculiar to the jenmis. Many people prefer to keep old servants in spite of their numerous faults. This is no ground for supposing that the tenure was a permanent one. The other grounds mentioned above are equally inconclusive.

But there is no doubt that, whatever be the terms or effect of the tenure, the tenants had for a very long time entertained the hope that they would not be evicted so long as they paid the rent regularly. And this hope was strengthened by the conduct of the jenmis in continuing

* T. Kunjuṛāman Nāyar's Memo on Land Tenures, para 16, p. 7.

the same tenant for years together. In this connection another point too has to be considered. It will be remembered that the allodial proprietors of land in Kēraḷa were a few men of the non-agricultural class and that the lands were mostly in the hands of cultivating peasants under this tenure. The agricultural prosperity of the State and the welfare of a very large portion of H. H. the Mahārāja's subjects had also to be considered in determining whether the tenure should be redeemable.

The subject was fully discussed by the late M. Sadāśivan Pillai, the First Judge of the Sadr Court, by Dewan Sir T. Mādhava Rao, and the then British Residents, Fisher and Newill. Fisher was of opinion that 'the kāṣom should be recognised as renewable periodically but not revocable so long as the holder pays the micchavāram and other dues demandable on renewal by the jenmi; secondly to simplify as much as possible the means of recovering the micchavāram and fees and to provide for the periodical renewal of deeds of payments of fees by such arrangements as will make the tenant's title depend on punctuality and ensure for him equal punctuality of renewal of his title by withholding the fees payable thereon until the title is renewed'. He suggested the passing of a Regulation on the lines of Regulation XXIX of 1802 and Regulation V of 1822 of Madras for the easy recovery of rent, etc.

Sadāśivan Pillai was of opinion that 'one scheme of action to settle existing disputes and to simplify existing tenures as far as possible should be laid down, and another scheme provided for the prevention of such doubtful tenures in future'. The difficulties then existing could, in his opinion, be avoided in future 'by a law defining how a document ought to be worded if intended to give the tenant a right of renewal; how, if otherwise, by making it necessary to adopt a given expression to convey a given intention It is easy to make clear provisions of the kind for the future and there will be no hardship in compelling people to

be clear in the expression of their intentions and in enforcing a particular phraseology.....The principle should be to let the parties regulate their own terms hereafter, the legislature only assisting them in recording those terms clearly'. With regard to existing disputes, 'the expediency of perpetuating this tenure by legislation was', in Sadāśivan Pillai's opinion, 'very questionable. The endeavour ought rather to be to put an end to this complicated tenure by which a conflicting co-proprietary right is given in the land to the jenmis and the tenants'. Though a combination of conflicting interests might have been serviceable and necessary in ancient times when a sort of feudal tie existed between the landlord and his tenants, the policy and object of all modern administrations, he said, should be to sweep away this conflict of interests and vest the sole proprietorship in one individual.*

Mr. Newill who succeeded Mr. Fisher did not desire to go so far as his predecessor. He disapproved of Mr. Fisher's suggestion to prohibit eviction of tenants after the usual period of twelve years and suggested that as a first step towards the equitable adjustment of the rights of the parties, a proclamation be issued stating "that after a fixed date, all official transactions in connection with kāṇappāṭṭom lands will be regulated by the terms of the lease as expressed in the document itself and that all parties concerned should accordingly be careful to express definitely the terms and conditions of the engagement in the document".

The suggestions of Messrs. Newill and Sadāśivan Pillai did not find favour with the Dewan, Sir T. Mādhava Rao. He deprecated any attempt to decide the question by mere analogies or by the adoption of the opinions of British authorities in respect of the state of things in the district of Malabar. The land laws of Travancore, said he, were not the same as those observed by European officers in Malabar,

* Sadāśivan Pillai's Memo on the relation between jenmis and kudiyaṅas.

for; in the latter the Muhammadan invasions had effected great changes. Nor was recent custom to be depended upon as a standard. Analogies, he thought, were misleading. He deprecated “any construction being placed upon the instruments of transfer from the jenmi to the tenant merely for the reason that, looked at by themselves, they can bear such construction”. “Supposing the instruments are open to more than one construction”, he said, “the adoption of any save and except that which is consistent with the acts and deportments of the parties to the instruments” should not be permitted. He would not look even to what was the understanding between them “in ages gone by”. The safest and most solid ground on which to rest the decision of this important question was, in his opinion, of a two-fold character; first, the custom of the country; and secondly, utility. If a valid custom be found to be existing and that custom be proved to concur with utility, he thought that such a custom should be maintained. He also thought that the custom found to be existing was good and therefore “the conclusion was unanimously arrived at that certain tenures covered by the general designation of *kāṇappāṭṭom* are not redeemable; in other words, that the tenant holding under such tenures is a perpetual tenant and as such cannot be ousted; that the jenmi or landlord was perpetually entitled to an annual rent and other fees, and in certain cases to fines for renewal of lease, the said rent being under certain limitations of local usage subject to periodical readjustment”.*

The Dewan, therefore, recommended the issue of a proclamation, known as the Royal Proclamation of the 25th Karkadakam 1042. He also recommended that an enactment should be framed for the speedy recovery of the jenmi's dues, but the latter proposal was not acted upon at that time owing to various reasons. The Proclamation

* Sir T. Mādhava Rao's Memo on the relation between jenmis and kudiyaṅs.

re-affirmed and rendered clear the sentiments expressed in the royal edicts of 1005 and 1907. It did not contain anything new or startling but only what was satisfactorily demonstrated to have long been the agrarian custom of the country. It was believed that it admirably protected the mutual interests of the tenants and the landlords and that it was conducive to agricultural improvements and prosperity. The Dewan hoped that "the provisions of this declaratory Notification, and those of His Highness's Notification of 1865 enfranchising the extensive crown lands comprehended under the designation of Sirkar pāṭṭom lands, constitute what may be termed the *Magna Charta* of Travancore ryot".*

It has already been said that the proposal of Dewan Sir T. Mādhava Rao to frame a Regulation for the speedy realisation of the jenmi's dues was not carried out for various reasons. The absence of such a Regulation and the deprivation of the right of ouster made the position of the jenmi an unenviable one. The jenmi's dues were hopelessly in arrears. Repeated complaints were made to Government by the jenmis, and the Government on enquiry found that the complaints were true.†

There was another matter of complaint. Before the kuḍiyān obtained the right of permanent occupancy, the question of renewal was not of very great importance. If the kuḍiyān was unwilling to accept the terms proposed by the jenmi and the jenmis were powerful in that locality, the kuḍiyān had to march out of the holding. But if the kuḍiyāns of one place were stronger than the jenmis, then the former imposed terms on the latter. It will thus be seen that the revision of the terms of the tenancy was

* Administration Report of Travancore for 1042 M. E.

† Kunjurāman Nāyar's Memo on Land Tenures, Part II, para 6. *

more a series of compromises between the parties than action on any settled principle. There could be but little uniformity in such conduct. But since the *kāṇappāṭṭom* tenure became permanent, the *jenmi* was not entitled to evict his *kuḍiyān* if the latter refused to accept the terms proposed by the *jenmi*. It became, therefore, necessary to act upon some principle in the matter of renewals of *kāṇappāṭṭom* leases. The absence of any definite rules defining those principles made it impossible for the parties to settle their differences out of court.

The course which best commended itself to the Government was to appoint a commission "to investigate and record the custom of the country in regard to the rent and other dues payable to the *jenmis*" by tenants holding lands on *kāṇappāṭṭom* and "in regard to any presents or remission of rent made by *jenmis* to tenants on occasions of domestic ceremonies and such cognate matters", with a view to a schedule being prepared for the guidance of the courts. Accordingly, a commission was appointed in Makaram 1060 consisting of the late Mr. Justice Kunjurāman Nāyar as president and one official and two non-officials as members. The commission travelled throughout the country and after a prolonged enquiry framed the necessary register in the interests of the *jenmis*. They also submitted a draft bill along with the report.

Meanwhile, difficulties had already arisen in the working of the Royal Proclamation of 1042. Though this Proclamation was made with the best of intentions, in its operation it did not satisfy either the *jenmi* or the *kuḍiyān*. It was defective in many respects. The *jenmi* did not get anything at all for the loss of his dues from the tenant, for; the tenant incurred forfeiture only if he was a defaulter for twelve years. The tenants complained that the courts were putting a narrow construction upon the terms of the Proclamation and in some cases acting contrary to its provisions. A number of decisions "affirming the right of the

jenmis" to evict their tenants "on the strength of implied covenants for surrender supposed to be contained in some *kāṇappāṭṭom* leases executed before the year 1042", were brought to the notice of the Government as a misconstruction of para 8 of the Proclamation. The subject was brought to the notice of the Sadr Court by the Government in 1055. The former suggested an amendment of the law, expressing clearly the intentions of the Legislature, as the courts felt great difficulty in construing the other paras too of the Proclamation. The ground of narrow construction of the Proclamation was based on the refusal of the courts to extend the application of the Proclamation to all classes of land-owners. The Proclamation being restrictive of the rights of the *jenmis*, the courts, according to the recognised rules of interpretation, acted upon the technical meaning of the term *jenmi*. They held that in that sense it applied only to the Nampūthiri Brahmans and the *dēvaswoms* owned by them. Accordingly, an *Eḷayathu*, a *Kartha*, *Māḍampi* or petty chief, a *Thampān*, a *Śūdra* who succeeded to the rights and properties of some old chieftain by virtue of a royal grant, an *Uṇṇi*, and *dēvaswoms* belonging to *Śūdras* were held not to be *jenmis* within the meaning of the Proclamation. Nor was a *Mūthathu* or one whose title was derived from a *dēvaswom* treated by the courts as a *jenmi*. But the intention of the framers of the Proclamation was, as may be gathered from the preamble and the previous correspondence, to extend the benefit of its provisions to the tenants of all those *jenmis* who might be considered to have been territorial lords and who, on account of their position, were not able or willing to take part in the actual cultivation of the soil.

Opportunity was therefore taken to place the law relating to *jenmis* and *kuḍiyāns* on a satisfactory footing and the *Jenmi and Kudiyaṇ Regulation V of 1071* was enacted. This Regulation, unlike the Proclamation which

it superseded, dealt exhaustively with the subject of *kāṇappāṭṭoms*. It defined 'jenmom land' as meaning land (other than *Panḍāravaka*, *Śrī Panḍāravaka*, *Kanḍukrishi* or *Sirkar Dēvaswom* land, recognised as such in *Sirkar* accounts) which is either entirely exempt from government tax or, if assessed to public revenue, is subject to *rājabhōgam* only, and the occupancy right in which is created for a money consideration (*kāṇom*) and is also subject to the payment of customary dues and the periodical renewal of the right on payment of renewal fees. The payment of renewal fees was considered by the courts to be the distinguishing characteristic of a *kāṇom*. The *kuḍiyān's* (*kāṇappāṭṭom* tenant) right of permanent occupancy was declared to be a right of permanent occupancy exempt from liability to eviction save as provided in section 7 (i.e., non-payment of rent continuously for twelve years or refusal to take a renewal within the time-limit fixed, wilful denial of *jenmi's* title, or committing waste), but where the *jenmis* were non-Brahmans, the *kuḍiyāns* must have held the land for at least twenty five years (Sec. 5). This Regulation, however, does not affect any right declared, established or already acquired by *jenmis* or *kuḍiyāns* before the date of its enactment (Sec. 44). The *jenmis* are at liberty to enter into any contracts with respect to their lands and the question of the redeemability of a tenure created thereafter will be determined according to the terms of the contract between the parties (Sec. 43). Nor does this Regulation affect any tenure redeemable under the provisions of the Royal Proclamation of 1042 (Sec. 42). The contracts of *kāṇappāṭṭom* should be in writing and registered and the deed must contain all the terms (Sec. 15). Any variation of those terms should also be in writing and registered (Sec. 20). The *kuḍiyān's* right is heritable and transferable, but the transfers are binding on the *jenmi* only with his written consent (Sec. 6). The grounds of forfeiture have been specified (Sec. 7), and the

kuḍiyān will be paid the value of the improvements effected by him when evicted. The jenmi's dues continue to be a first charge on the holding (Sec. 13) and must be paid on the due dates (Sec. 17). The kāṇappāṭṭoms should be renewed at the end of every twelve years and the obligation to do so is mutual (Secs. 11 & 18), but the kuḍiyān may at that time surrender his holding (Sec. 12). The mode of enhancement of micchavāṛam is laid down by Section 14 and the grounds on which the courts will allow such enhancement are given in Section 21. The principles of the revision of the terms of the tenancy are given in Sections 22-25. The enhancement or abatement of micchavāṛam should not be unpaid. Chapter III, Part B (Secs. 27-32), allows the kuḍiyān to deposit the jenmi's dues in court. Sections 33-40, which are new, allow the jenmi to recover his dues summarily. This Regulation also settles two other important questions. The validity of transfers of jenmom lands was doubted but it has been laid down that sales of the jenmi's rights are valid (Sec. 4). When such alienations took place, the Sirkar enhanced the tax on the property. It was doubtful who should pay the newly imposed tax. The Regulation makes it payable by the transferee (Sec. 4). If the kuḍiyān is forced to pay it, he is allowed by the courts to deduct it from the micchavāṛam payable by him. Again, the jenmom right may be transferred to a non-Brahman or a non-Hindu. In such cases it will be impossible to ascertain when the customary dues are to be paid. The Regulation gives the kuḍiyān, on such transfer taking place, the right to call upon the transferee to commute the customary dues into fixed annual payment (Sec. 26). The term improvement is defined (Secs. 2-14) so that there may not be any dispute about it when the question of fixing the pāṭṭom or the revision of the terms of the kāṇappāṭṭom arises. In fact the Regulation fixed to meet all the difficulties which presented themselves and sought to place the relationship between the jenmis and the kuḍiyāns

on a fair and equitable basis so far as conditions could permit.

After the passing of Regulation V of 1071 things went on smoothly between the jenmis and the tenants for the next ten years. Subsequently both the jenmis and the kuḍiyāns made repeated representations to the Government regarding the difficulties felt in the actual working of the Regulation and the amendments necessary to meet their points of view. In 1915, the Government thought that the time had come to enquire into the operation of the Jenmi and Kuḍiyān Regulation of 1071, which had then been in force for over eighteen years, and accordingly appointed a committee to make an enquiry and report. At the same time the Government pointed out that they were not prepared to go back on the broad policy laid down by the Proclamation of 1042 granting fixity of tenure to kāṇom tenants. Towards the close of Eḍavam 1091 this committee submitted a divided report, the representatives of the jenmis taking one view (minority) and those of the tenants taking another view. After consideration for a long time, the Government published a bill in 1924. But it was noticed that the provisions of the bill did not satisfy either the jenmis or the kuḍiyāns between whom sharp differences of opinion existed. The Government therefore took time to devise means to compose the differences if possible. A Round Table Conference under the presidency of the Dewan was held, in which all the divergent interests were represented. The result was that in 1930 the Government introduced another bill which after various vicissitudes emerged as Regulation XII of 1108 which has cut the gordian knot of the jenmi and kuḍiyān problem. Far-reaching changes were made by this Regulation. The jenmis who were regarded as landholders were practically reduced to the position of persons entitled merely to certain

Changes made by the
Jenmi and Kuḍiyān
Amendment Regu-
lation of 1108.
(Reg. XII of 1108.)

dues called jenmikkaṛam, which are a charge on the land. The tenants became practically the owners of the land subject to the payment of the jenmi's dues. Those jenmi's dues which were payable on specific occasions, like renewal fees, Āravakāśams, etc., were converted into annual payments which, added along with the annual micchavāṛam, were termed 'jenmikkaṛam'.

The following is a summary of the more important changes made by the Amendment Regulation:—

1. The Regulation is the sole basis of the rights and duties of the jenmis or kuḍiyāns and no customary or other rights outside the Regulation are recognised. (Sec. 2).

2. The jenmi has no right or interest in the land except the right to receive jenmikkaṛam and the kuḍiyān is to be the full owner of the land subject only to the payment of jenmikkaṛam. The kuḍiyān cannot relinquish the land. His right is not only heritable and transferable, but he can do or suffer anything to be done on the land without reference to or interference from the jenmi (Sec. 5).

3. The jenmikkaṛam is distributed over each parcel of land in the proportion of the Sirkar tax. (Sec. 6 & 7).

4. Thirty per cent. of the kāṇom amount is fixed as the maximum renewal fees (Sec. 8). The jenmikkaṛam is a first charge on the holding (Sec. 9) on a transfer of the jenmi's or tenant's right; the other party is not bound unless notice of the transfer is given (Secs. 10-12).

5. Renewals are abolished. It is not obligatory on the jenmi to renew or on the kuḍiyān to accept the renewal of the kāṇappāṭṭom (Sec. 13).

6. The jenmikkaṛam is not liable to alteration or revision except after the next land revenue settlement, and even at the time of the next settlement it has only to be enhanced or reduced according as, and in the proportion in which, the Sirkar tax is enhanced or reduced, subject to a maximum enhancement of 10 per cent. and subject also to

no enhancement having taken place within twelve years prior to the settlement (Sec. 14).

7. The jenmikkaṛam alone is payable to the jenmi by the kuḍiyān with interest at 9 per cent. or at 6 per cent. if collected by the Sirkar on behalf of the jenmis (Sec. 17). Jenmikkaṛam is payable only in money (Sec. 18) at the commutation rate fixed under the Regulation (Sec. 46).

8. A jenmi may apply to the Tahsildar of the taluk where the land is situate to recover the jenmikkaṛam from the kuḍiyān under the Revenue Recovery process, provided the arrears are not more than one year old on the date of application (Sec. 26 A).

9. The Government is to make a settlement of jenmikkaṛams and a register of jenmikkaṛams is to be maintained. The Government undertakes to collect jenmikkaṛam for payment to the jenmis after deducting the cost of collection (Sec. 40 A to 40 N).

10. When the land is acquired by the Government under the Land Acquisition Regulation, the compensation is to be apportioned as follows:—The value of building is to belong entirely to the kuḍiyān and the balance to the jenmi and the kuḍiyān in the proportion of the jenmikkaṛam and the average annual net produce of the land or portion acquired as the case may be (Sec. 45).

11. The period of limitation for the recovery of jenmikkaṛam is reduced from twelve years to six years (Sec. 47).

Besides kāṇappattom, there are a number of other
Other tenures relating to jenmom property,
ing to jenmom lands. e. g., Verumpāṭṭom, Otti, Aḍima, Kulik-
kāṇom, etc.

(a) Verumpāṭṭom is a simple lease without any debt or money consideration entering into the transaction. This may be of two kinds, i. e., (i) where the rent is a fixed quantity of grain or money, and (ii) where the proprietor and

the cultivator engages to divide, the produce of the land in certain fixed proportions at the time of the harvest. The lease may be oral or written, but when the term exceeds one year it has to be stamped and registered. The tenant has to quit the land after the expiry of the term and has no other interest in the land.

(b) *Pāṭṭom and Kuḷikkāṇom*. This tenure, while resembling the verumpāṭṭom, confers on the tenant the right to make improvements on the land, for which he is entitled to receive compensation on the expiry of his term. When no term is stipulated, the period understood is twelve years. But a mere lease authorising the lessee to plant trees and providing for compensation at the time of eviction does not thereby become a kuḷikkāṇom and does not ensure for twelve years.*

(c) *Otti* means a usufructuary mortgage. In this kind of transaction an amount is borrowed by the jenmi on the security of his land and the property is left with the kuḷiyān for enjoyment of its produce as interest for the amount. Very often some micchavāṇam, i.e., the excess of the annual mesne profits over the interest on the mortgage amount is directed to be paid by the kuḷiyān to the jenmi, which is a first charge on the kuḷiyān's interest. In the case of jenmōm properties, unless the document expressly provided for redemption, the incidents of the kāṇom tenure will attach themselves to the transaction. The mortgagee may sue for recovery of the mortgage amount by selling the mortgaged property.†

(d) *Otti and Kuḷikkāṇom*. This is similar to the above, the only difference being that in the latter tenure kuḷikkāṇom or payment for improvements will be made on the expiry of the term. When a mortgage deed contains an express clause to the effect that the mortgagee is to enjoy the

* 7 T. L. R. 44 F.B. Sankarān Gōvindan v. Thymookil Swāmiyār.

† 25 T. L. J. 1354, Nīlakanṭhan Thampi v. Paṛamēswarān Pillay,

property, planting coconut and other trees, and that compensation will be paid for at redemption, the intention in all such cases, in the absence of express contract to the contrary, is that the mortgagee should enjoy the land for a term of twelve years, and to manifest such intention the express mention of a term or terms as *kulikkāṇom*, etc., is not essential.*

(e) *Kuḷi kārāṇma* tenure is a permanent improving lease.† It is a planting lease executed by the jenmis for their properties lying waste, for the purpose of improving the same, on receipt of a consideration fixed by calculating the number of trees to be planted thereon, and it is customary when the trees begin to bear to assess the *pāṭṭom* of such trees and to obtain a *mēlaima* document from the jenmi. It has never been treated as *kāṇappāṭṭom* since the consideration for the document is intended as the price of the pit or the ground and as a premium for the grant of the lease in perpetuity.‡

(f) *Aṭṭipp̄r*. *Aṭṭipp̄r* is the out and out surrender of the jenmi's rights by sale. This surrender of the full rights of the jenmi was in ancient days looked upon as very undignifying and hence such surrender, whenever indispensable, was made by slow degrees, so much so that when a jenmi had unavoidably to sell his property all at once, he was obliged to go through the several stages together. These stages are three in number:—(1) The jenmi has to execute a *kaippaḍa otti* or mortgage receiving almost the full value as debt. The purchaser then obtains possession of the property. But he is not complete owner and therefore can neither cut a tree nor burn nor bury the dead in it nor sell it to others. After the first deed is executed two other deeds named *ottikkumpuram* and *kuḍimanir* should

* 15 T.L.R. 36; 25 T.L.R. 1; 18 T.L.J. 338; 13 T.L.J. 36 at 40 F.B.(2).

† 4 S. D. 294 at 297.

‡ 15 T.L.R. 867.

be executed in succession. The tenant now pays 20 per cent. of the value of the property. When these two deeds are also signed and delivered, the jenmi is considered to have lost, and the purchaser to have gained $7/8$ of the rights in or dominion over the property; and the buyer can now cut wood or perform funeral obsequies in it. The last part of the transaction, viz., aṭṭiprēr, is then drawn up to complete the sale and transfer the full freehold to the purchaser. For executing this deed the following ceremonies had to be observed in the presence of the six persons mentioned below :—

1. A caste jenmi.
2. A near relation.
3. The heir.
4. The Rājā's or Sirkar's representative.
5. The person who wrote or drew out the deed.
6. The headman of the village.

All these assembled, the jenmi brought in a vessel of water generally a kinḍi,* taken from the garden to be finally sold with some rice and flower put into it. The buyer then put 2 fs. ($4\frac{1}{2}$ as.) as Nirkānom (water fee) into the kinḍi. The jenmi and the buyer then stood facing west and east respectively. The former informed his heirs that he was going to make over his jenmi rights to such and such a person and with their consent poured out the water saying "I give you the water of such a compound to drink". The purchaser received the water in his right hand and drank it; but if he was of a higher caste, he washed his face and feet with it. Before the above presentation of water, the purchaser paid 4 fs. (9 as.) Oppukānom, (ஒப்புகாணம்) to sign the four deeds and, at the time of drinking the water, the

* A pewter vessel with a tube through which the water flows. It is the most commonly used vessel in this country and is nearly unknown in the eastern districts.

heir was given 4 fs. called Ananthiravan naḍukāṇom (അനന്തിരവൻ നടുക്കാണ്ണം) a present to the heir to give his consent. A thūśikkāṇom (തൂശിക്കാണ്ണം) of 8 fanams was paid to the person who drew out the deed. Thūśi (തൂശി) is the iron style or instrument used for writing on cadjans. A present of 2 or 3 fs. should also be made to each of the six persons for their attendance. Originally the whole transaction was brought to a close by the payment of a fee both by the seller and the purchaser to the Sirkar, the amount being 10 per cent. of the value of the property. This fee was discontinued in later times. If the heir objected to the sale, business could not be proceeded with. This was the custom in early Travancore, nay, throughout Kōraḷa. Major Walker says:— “In former times the transfer of jenmom was made by presenting water before witnesses and the whole performance was verbal, but when the Kali Yuga commenced, water and words were found insufficient”. The ceremony of pouring water and drinking it, seems to have had its origin from the fact that the land was reclaimed from water. Whatever be the origin, such a symbol of delivery of property was not peculiar to this country. The English Common Law requires delivery of a clod of earth to make a conveyance complete and this ceremony is known as the “Livery of Seisin”. The above ceremony is no longer required for a sale of the jenmom right in modern days. The Stamp and Registration laws regulate such transactions.

Besides the tenures named above, there are a few denominations of tenure under this head prevailing, though rarely, in some parts of the country. The chief among them are :—

1. Olavupāṭṭam.
2. Olavōla.
3. Vayalvālotti.
4. Olavotti.
5. Paṭṭōla.
6. Mārāppāṭṭom or Kāraṇmappāṭṭom.

7. Vecchupāthippāṭṭom.
8. Kuḍippāthippāṭṭom.
9. Kuliappāṭṭom or Varampaḍakkapraṭṭom.
10. Karampāṭṭom.
11. Verumpāṭṭaṭhēṭṭam.
12. Pāthivāram.
13. Viṭṭhupāthi[†]heṭṭam.
14. Vittitṭum kilocchupāthi or Ittunpāthipraṭṭom.
15. Chōrā otti or mīḷā otti.
16. Thuyarā otti.
17. Irakkārāṇma.
18. Vecchupāthikkārāṇma.
19. Anchuranḍu kārāṇma.
20. Pomiṭṭu kārāṇma.
21. Ravotti *alias* ura otti—an inferior kind of redeemable mortgage.*
22. Nēr otti.
23. Micchavāra otti.
24. Kaḍamuri and pāṭṭom.

These minor tenures are not very different from those mentioned above and described in extenso but are slight variations or modifications of those tenures adopted in different localities to suit special local conditions. Some of them partake of the nature of a kānappāṭṭom tenure or of a lease and the variations in them are caused by special conditions imposed about rent or services to be rendered by the tenants. The irredeemability of property in some of these tenures and the fixity of rent in others making it a fraction of the total produce are their special features. The following tenures among them require special mention.

1. *Olavotti* :—This partakes of the nature of a lease and of a mortgage under which the grantee could not be evicted before the expiry of twelve years.†

* 3 T. L. J. 229.

† 19 T. L. R. 70.

2. *Nēr Otti* :—Originally it was interpreted by the courts to mean an ordinary redeemable otti in which interest on the loan was equal to the rent derivable from the property.¹ But in a latter decision² it was held that the term applied originally even to *kāṇapāṭṭom* transactions.

3. *Micchavāra Otti* :—When a *jenmi* mortgages his right to collect *micchavāram* from a *kāṇom* tenant and directs the *kudiyān* to pay it to the mortgagee, the mortgage is termed *micchavāra otti*.³

4. *Kārāṇma* :—The term *kārāṇma* imports a permanent tenure.⁴ A *kārāṇma* tenure is not in the eye of the law equivalent to an absolute conveyance.⁵ The *kārāṇma*-holder is only a mortgagee and does not succeed to all the rights of the *jenmi*. But he cannot be redeemed. Where lands are held on *kārāṇma* tenure subject to certain services, the grant cannot be resumed so long as the grantee is willing and ready to perform the services, even though the grantor does not want the services to be performed any more.⁶ Land held on *kārāṇma* for services to be rendered are by their very nature inalienable and the holders for the time being have no disposing power over them. They can therefore neither be alienated voluntarily nor by operation of law, such as by court sale.⁷

5. *Ira Kārāṇma* :—This has been defined as a perpetual lease subject to the payment of *Ira micchavāram* to the *jenmi*.⁸ The lessee cannot be deemed to be a *jenmi* even though the land is *jenmom* property. So a *kaṇom pāṭṭom* executed by such lessee (*Ira kārāṇma* holder) is redeemable.⁹ The *jenmi* who grants an *Ira kārāṇma* deed has no right to grant renewals and could not evict the lessee on the ground of non-payment of the nominal rent reserved to him. Though the

(1) 16 T. L. R. 182.

(6) 4 S. D. 294.

(2) 18 T. L. J. 766.

(7) 46 T. L. R. 59.

(3) 30 T. L. R. 256.

(8) 8 T.L.J. 11 at 13; 4 S. D, 294 at 297.

(4) 4 S. D. 294.

(9) 11 T. L. J. 166 (F. B).

(5) 8 T. L. J. 11 ; 18 T. L. J. 223 N. C.

tenure falls short of an absolute sale, for all practical purposes it is a sale.* The lessee is practically the owner and the jenmi is only entitled to the kuḍivila for royal trees felled from the property by the Forest Department.†

6. *Ponniṭṭu Kārāṇma* :—This has the effect of a complete sale. It differs from other *kārāṇma* transactions in that it requires a special and additional consideration over and above the requisites of other *kārāṇma* deeds. This additional consideration is known as '*ponnu*', meaning value, and forms its special feature and is necessary to constitute the transaction a real sale or transfer of the full jenmom rights as in an *aṭṭippēr*. It is only in this *ponniṭṭu kārāṇma* and *aṭṭippēr* deeds that the words indicating transfer of full rights are put in. These words or expressions are peculiar to jenmom deeds and indicate how even in primitive society it was thought necessary to put in words exhaustive of all possible rights in the soil.

These words are “വസ്തുക്കളും അതിവുള്ള മേലഭയം, കീഴഭയം, കല്ലു, കട്ട, കാഞ്ഞിരം, കുറുനി, മുളു, മുറുട്ടു, മുക്കൻപാമ്പു, അറുപോക്കം വഴി, നീർപോക്കം ചാൽ, മാൻപെട്ടം കാട്ടു, തേൻവെട്ടം ചോല, നീർ, നീയി, കിണറു, അകാരം, പാതാളം, മുതലയായതു”, and mean “the properties named and the produce thereon either on the surface or in the sub-soil, the stones, the rugged rocks, *kānji-ram* trees, thorns, rough surfaces, the ferocious snake, the paths therein used by the public, the water courses, the jungle of beasts, the groves of bee-hives, water, treasure troves, wells, the sky above and the nether strata below, etc.” The list is complete and exhaustive giving no room for any doubtful interpretation and corresponds to the *esque and caelumoe esquo and solum* of English conveyance, meaning “from the centre of the earth to the heavens above”.

7. *Kaḍamuri and Pāṭṭom* :—This is a lease in which the lessee has advanced a loan to the lessor which, though not

* 4 S. D. 54 at 56.

† 10 T. L. J. 51.

actually charged on the land, has to be paid back when the land is redeemed. The transaction, though equivalent to a mortgage, does not constitute one in the eye of the law. The jenmis usually resort to the expedient of executing *ven-pāṭṭom* and *kaḍamuri* deeds separately in order to take the case out of the operation of the law relating to *kāṇappāṭṭoms*. Lands held under such leases are redeemable.*

Before leaving this part of the subject, it remains to examine one more class of leases made by the jenmis with regard to their mountainous and jungle tracts. In the case of these lands which are lying waste, the person who wishes to bring such lands under cultivation first takes the permission of the jenmi and begins his work; and out of the produce the cultivator pays one-fourth to the jenmi, no deduction being made either for the seed or cost of labour. This is called *vāram* or the rights or dues of the jenmi. Afterwards, besides the payment of *pāṭṭom* or rent, the *pāṭṭakkāran* or lessee is obliged to perform certain gratuitous services to the jenmi. In connection with the *Oṇam* festival he must pay two fanams. The usual period of such lease generally extends from three to six years, but the term can be extended if both parties agree; every lease, however, must expire with the life of the jenmi and has to be renewed by the heirs on payment of a year's *pāṭṭom* and must suffer a deduction or addition of 13 per cent. on the *kāṇom* amount, if any. A new deed is executed when any *kāṇom* is paid and has to be renewed on the death of the lessee also on the original condition if the jenmi is willing to continue the lease to his heirs. When the jenmi desires to recover the property from the lessee, he must return the *kāṇom* amount and also pay compensation for *kulikkāṇom* or improvements made by the lessee. On the other hand, if the tenant causes damage to the property, diminishing thereby its income, such damages will be deducted from the *kāṇom* amount. If, however, the tenant wishes to relinquish his holding before the lease

* 10 T. L. R. 52; 17 T. L. R. 3.

expires, he is not entitled to the full *kāṇom* amount but gets only a portion thereof, say 80 per cent. This is called *sākshi* amount. The *jenmi*, when he wishes to revoke his lease, must return the *kāṇom* amount, the expenses of executing the documents as well as double the value of the improvements. Both these can take place only with the mutual consent of the parties.

Kuḍijenmom or *alienated jenmom land*. This was a new tenure created in 1066 by Huzur Sādhana No. 5 of 1066. There was another tenure of the same name recognised from time immemorial.* Such old tenures were converted into inams by Section 25 of the Settlement Proclamation and absolutely alienated *dēvaswom* and *brahmaswom* *jenmom* lands were called by this name.

To assess alienated *jenmom* lands with *rājabhōgam* was a practice in vogue in this State from very early times. That such was the practice can also be seen from the Royal Proclamation dated 22nd Dhanu 993 M. E., which laid down that the system of levying *rājabhōgam* on *jenmom* (*dēvaswom* and *brahmaswom*) lands obtained in the southern taluks also. Thus *rājabhōgam* was levied on the *dēvaswom* and *brahmaswom* lands demised on *Otti*, *Aḍima*, *Anubhōgam*, *Thiruvuḷam* and other similar tenures. Prior to this Proclamation, garden lands in the southern taluks, under the head of alienated *jenmom*, paid no *rājabhōgam* though the wet lands under the same category paid tax to the *Sirkar*. In the order relating to the treatment of *dēvaswom* and *brahmaswom* *thanathu* rights of the *jenmis*, passed in the year 1066,† it was directed that those lands on such alienation should be converted into *Kuḍijenmom* and assessed with $\frac{1}{4}$ *pāṭṭom*. There were conflicting orders with regard to the imposition of *rājabhōgam* on *jenmom* lands (which were already assessed with *viṭhukāl*, etc.) demised

* Vide the *Granthavaṇi* of *Srī Padmanābha Swami* temple dated 914 M. E.

† Vide G. O. No. 5 dated 20-1-1066.

on Aṭṭippār and they were set right by G. O. No. 1482 dated 7-4-1071, which laid down that all jenmom lands, whether tax-paying or tax-free, when sold on aṭṭippār, were to be treated as *Kudijenmom* and assessed with $\frac{1}{4}$ pāṭṭom. This applied to jenmom lands gifted to strangers on sarvaswādānom also.* It was also laid down in that G. O. that if the rājabhōgam imposed at $\frac{1}{4}$ pāṭṭom was found to be less than the original rājabhōgam, viz., viṭhukāl, viṭhāra, etc., it should yield to the existing tax. Subsequent to the settlement, Kaṛampathippu Rules were passed. They applied only to jenmom lands on alienation and not to any other favourably assessed lands. Later the Kaṛampathippu Rules were amended and it was laid down then that in all cases in which a rājabhōgam of one-eighth assessment is imposed, the lands should be recorded as jenmivaka kāṇom and that when the lands were sold outright and one-fourth assessment was imposed, they should be recorded as jenmivaka aṭṭippār.

Closely allied to jenmom lands are the Eḍavakais.

Though they are analogous to jenmom lands, Eḍavakais. they are different from the latter in origin and incidence.

Definition of Eḍavakais.:—The term “Eḍavakai” as defined in the Eḍavakai Regulation, III of 1109, means “any tract or area recognised as such in our government accounts, the whole or any portion of which is exempt from the payment of land revenue to Our Government”. The tracts recognised as Eḍavakais in government accounts are four in number. They are :—(i) Kilimānūr, (ii) Eḍappall̃y, (iii) Pūnjār and (iv) Vanjippuḷa. Of these, the first two are also known as the estates of Kilimānūr and Eḍappall̃y.

General characteristics of the Eḍavakais :—All the Eḍavakais except Kilimānūr are supposed to be the lands comprised in the petty kingdoms and principalities which

* Vide Settlement Dewan Peishkar's order No. 377/20, dated 30-1-1083.

remained independent or quasi-independent until the conquest and consolidation of the State in the 18th century. They are all tax-free as far as the state revenue is concerned. Though they are in this respect analogous to jenmom lands (brahmaswom and dēvaswom thanathu lands) they are different from the latter in origin and incidence. They are similarly different from the Zemindaris of British India also, as the tenures under which the lands are given to, and held by the ryots are dissimilar and as the exemption from taxation which is a characteristic feature of the Eḍavakais is absent in the other. These Eḍavakais are outside the state Āyacut and so the state has no concern with their internal survey and settlement. The position of the chiefs with respect to these Eḍavakais was that of absolute proprietors and the tenants in them, excepting those that hold under permanent tenures, such as aḍima and thiruvuḷam, had no permanent rights of occupancy. The proclamations of 1040 and 1042 M.E., which conferred permanent occupancy rights on the tenants of the sirkar villages were not applicable to Eḍavakai tenants. Permanent occupancy right was granted to the tenants of the Kiḷimānūr and the Eḍappally estates in 1068 M. E., by the Estates Rent Recovery Regulation of that year. The tenants of Pūnjār and Vanjippuḷa do not possess this right now. They will acquire it under the Eḍavakai Regulation III of 1109, from and after the date of the settlement of those Eḍavakais being declared complete by the government subject to such conditions as may be lawfully imposed.

Origin and nature of the Eḍavakais:—All Eḍavakais are not of the same origin.

(i) *Kiḷimānūr*:—This Eḍavakai was granted to the family of the Kiḷimānūr Kōil Thampurān in 903 M. E, in recognition of the bravery with which a member of that family saved a Rāṇi and the heir-apparent to the throne of Travancore (His Highness Rāma Varma Mahārāja who reigned from 933 to 973) from their enemies by sacrificing

his own life. The survey and settlement of this Eḍavakai was conducted entirely at government cost along with the general settlement of the State in 1067. The tenures in it are identical with those of the sirkar villages and the assessment leviable on them was regulated on the same principles as those applied to similar tenures in the sirkar villages. The rents due to the Eḍavakai from the ryots are recovered under the authority of a special enactment, Regulation IV of 1068. The puthuvals in this Eḍavakai are registered as paṇḍārappāṭṭom.

(ii) *Eḍappally*:—This was a small state which became subject to Travancore in 1000 M. E. Its Chief pays a tribute to Travancore State for police protection. This Eḍavakai was also surveyed and settled along with the last general settlement of the State at the request and on behalf of the proprietor, the Sirkar defraying one-half of the cost of settlement and three-fourths of that of survey. The tenures in this Eḍavakai correspond in their characteristics to the like groups in sirkar villages. The Rent Recovery Regulation IV of 1068, applies to this Eḍavakai also.

(iii) *Pūnjār*:—This Eḍavakai is the property of the Pūnjār Rājās. The lands were purchased by them from the Thekkumkūr Rājās. On the annexation of Thekkumkūr by Travancore the Pūnjār Chief became the vassal of Travancore. It was not 'settled' during the last general settlement of the State and it is now taken up for survey and settlement as per the Eḍavakai Regulation, III of 1109. This Eḍavakai has within its limits lands belonging to the Sirkar dēvaswoms and other jenmis and these lands were settled at the general settlement and included in the State Āyacut. The tenures in this Eḍavakai are mostly Venpāṭṭom and other redeemable leases.

(iv) *Vanjippuḷa*:—This Eḍavakai is believed to have been conferred on the Vanjippuḷa Chief as a mark of favour by some of the early sovereigns of Travancore. This too was not settled along with the general settlement of the

State and is now taken up for survey and settlement under the Eḍavakai Regulation, III of 1109. Tenures extant in this Eḍavakai are Venpāṭṭom, Sthirappāṭṭom, Erakkārāṇma, Aḍima, Thiruvuḷam, etc.

Eḍavakai villages.—The Eḍavakai villages recognised as such in the revenue accounts are the following :—

- | | |
|-----------------|--|
| (i) Eḍappalḷy. | (a) Eḍappalḷy North in Parūr taluk. |
| | (b) Eḍappalḷy South Do. |
| | (c) Thrikkunnappuḷa in Kārthikappalḷy taluk. |
| | (d) Kallūppāra in Thiruvalla taluk. |
| | (e) Vāḷakkuḷam in Kunnaṭhunād taluk. |
| (ii) Kiḷimānūr. | (a) Paḷayakunnumēl in Chirayinkīl taluk. |
| | (b) Kiḷimānūr. Do. |
| (iii) Pūnjār. | Pūnjar in Mīnachil taluk. |
| (iv) Vanjippuḷa | (a) Cheruvallḷy in Changanāśśēry taluk. |
| | (b) Chirakkaḍavu Do. Do. |
| | (c) Peṇuvanthānam in Pīrmēdo taluk. |

All unassessed lands within the limits of these Eḍavakais, if they are used or reserved for public purposes or for the communal use of villagers, are deemed to be the property of Government for purposes of the Land Conservancy Regulation.

Privileges conferred on the Chiefs and their tenants by the Eḍavakai Regulation :—

The Eḍavakai Regulation enables the Chiefs to make assignments of their thanathu lands within their Eḍavakais, provided that such assignments shall be made in accordance with the law and rules for the time being in force for the assignment of government lands so far as they are applicable, and subject to the rights, if any, of third parties. Such

assignees will thereafter be deemed registered landholders. Unauthorised occupations of thanathu lands in the Eḍavakais are made liable to be dealt with as if they are the property of Government within the meaning of the Land Conservancy Regulation for the purpose of such of the provisions thereof as may be notified by government in the gazette on that behalf. The rent and mēlvāram due to the chiefs are declared a first charge on the land concerned and they may, in default of payment, be recovered as arrears of public revenue under the Revenue Recovery Regulation. The Rent Roll and other accounts bearing on the lands of the Eḍavakai have therefore to be kept in the form in which they are kept in sirkar villages and they are subjected to the inspection of government officers. The powers of a proverthikār or of a Tahsildar under the Revenue Recovery Regulation, or of a Division Peishkar under the Land Conservancy Regulation will be conferred on the agents or servants of the chiefs, provided that such agents are government servants whose services have been lent to the chief.

SECTION B. SIRKAR LANDS.

Broadly speaking, all lands other than jenmom properties belong to this class and are liable to assessment in some form or other. They are generally known as Sirkar or *panḷāṛavaka* as distinguished from the *śrīpanḷāṛavaka* or properties belonging to the Śrī Padmanābhaswāmy Temple at Trivandrum. But the tenures of these two classes of lands are almost similar.

The theory in respect of these lands is that the Government is the landlord and the rights of the ryots are all derived from the Sirkar. The origin of Sirkar lands have been touched upon in the earlier portions of the chapter. But it may be briefly recapitulated here. According to tradition the lands were owned by the jenmis. But during the *Ērūmāl* period and subsequently, lands were ceded to

the king (or Protector) by these jenmis for his maintenance. Then there was the conquest of the petty chiefs and kings and consolidation of the country by Mahārāja Mārthāṇḍa Varma. There were also various cases of escheat. When Government assumed the management of various temples and religious institutions, the lands appertaining to them became naturally government lands. Then the accretions by the action of rivers, lakes and the sea, were also government lands. Thus about three-fourths of the whole lands in the State now belong to the Sirkar and the Sirkar has sometimes been termed the 'Biggest Jenmi'. The tenants were holding the lands under the jenmi. None of the arrangements with regard to the holding of lands made by the Sirkar in olden times indicates the consciousness of the existence of occupancy rights in the ryots except those expressly conceded to them by contract or grant and it was not until 1040 that Government by a Royal Proclamation conferred the rights of permanent occupancy upon the large body of verumpāṭṭom holders under the Sirkar who until then held the lands, in theory at least, as tenants-at-will. This proclamation has rightly been called the Magna Charta of the ryots of Travancore. The effect of the liberal policy adopted in 1040 by the Pāṭṭom Proclamation has been to bring about a distribution or diffusion of landed property among all classes of His Highness' subjects and the evils arising from land monopoly have thus been remedied to a considerable extent. The lands are practically in the ownership and occupation of the occupants so long as the government dues are paid. This policy of conferring permanent rights of occupancy, heritable and alienable, on government lands by the Pāṭṭom Proclamation of 1040 has ever since been kept up by Government as is evident from the Proclamation of 1042, the Settlement Proclamation of 1061, the Rent Recovery Regulation of 1068, the Munro Island Proclamation of 1105, and the Eḍavakai Regulation of 1109, all of which supplemented the Pāṭṭom Proclamation.

The various sub-divisions and classifications of government lands are shown below.

SIRKAR LANDS.

Registered lands.	Porampōkes.	Thaṛiśu.	Thanathu lands.	Reserved forests and reserved lands.	Unreserved lands.
Pandāṛā- vaka.	Sṛipandāṛā- vakā.	Kandukrishni.	Sṛipādā- lands.		

Before considering the various tenures relating to the Sirkar lands a brief description of the above varieties of such lands may be made.

I. (a) *Pandāṛāvaka lands*. As already mentioned, they are lands of which the State is the owner or landlord and all rights of the ryot are derived from the Sirkar. The tenant who is merely a tenant-at-will became by the Pāṭṭom Proclamation of 1040 practically the owner of the land subject to the payment of government tax. Of the various types of Registered lands, pandāṛāvaka lands alone increase consequent on the expansion of cultivation and conversion of non-pandāṛāvaka tenures. Escheats and relinquishments of whatever description of land would in strict law go to augment them. The Dēvaswom Proclamation of 1097 has converted the whole of the Sirkar dēvaswomvaka lands into pandāṛāvaka lands.

(b) *Sṛīpandāṛāvaka lands*. These are lands belonging to the temple of Śrī Padmanābhaswāmy. Their origin goes back to remote antiquity. The temple and the lands are managed by the State. These lands lie scattered in the taluks of the Trivandrum division. The rent due from these lands are treated as 'public revenue', by Regulation I of 1068. These lands are more or less similar to pandāṛāvaka lands as regards varieties of tenure and

rates of assessment, and the method of revision is the same as that for the other kind of land. The bulk of these lands pay, in addition to the revenue due to the Śrīpandāravaka, rājabhōgam to the Sirkar.

(c) *Kanḍukrishi lands.* These are the Sthānam properties of H. H. the Mahārāja, i.e., the home-farm of the sovereign and are cultivated by the tenants. They lie scattered in Trivandrum, Quilon and Kōṭṭayam divisions. The rent or revenue from them belong to and are appropriated to the Privy Purse. They are managed by the Kanḍukrishi Department. The tenants have no right of property in them. They are merely tenants-at-will. But they are rarely interfered with so long as the dues are paid. They have been settled on the same principles as other lands and are allowed to be enjoyed on the existing terms subject only to the payment of pāṭṭom or assessment. But in some cases these lands are charged with rājabhōgam to the Sirkar as distinguished from rent. If the tenant fails to pay the rent, it will be recovered by coercive process under the Revenue Recovery Regulation from his other properties and no further lease will be granted. The policy of the Government is to bring the revenue registry of alienated Kanḍukrishi lands into accord with actual possession by transferring Registry in favour of the alienees in possession. Kanḍukrishi lands are either pāṭṭom or thanathu. Pāṭṭom lands are those for which paṭṭas were issued at the time of the last settlement, while thanathu lands are those for which no paṭṭas were issued at the settlement and which are enjoyed by the tenants either on payment of the rent fixed at the settlement or on Kuṭhakappāṭṭom given by the Kanḍukrishi Department. Generally the tenants of Kanḍukrishi pāṭṭom lands are, when they are resumed, entitled to compensation for their improvements, while the tenants of the thanathu lands cannot as a matter of right claim it. When Kanḍukrishi lands are acquired for government purposes, compensation

should be awarded for the crown's right as well as for the private rights in them.

(d) *Srīpādam lands*:— These lands, like the Kaṇḍukrishi lands, are the private property of the sovereign, the Āttingal Rāṇis having the right to appropriate the revenue from these lands.* The tenures and the assessment leviable are the same as those of paṇḍāravaka land.

II. *Porampōke lands* mean and include unassessed lands which are the property of the government, used or reserved for public purposes or for the communal use of the villagers. They comprise:—

(a) all public roads, streets, lanes and paths, bridges, ditches, dykes and fences on or besides the same,

(b) the beds and banks of rivers, irrigation and drainage channels, traffic canals, tanks, lakes, backwaters and water courses,

(c) markets, burial grounds, landing ghats; and

(d) all other property of the government which are declared to be porampōke under the Land Conservancy Regulation.

All the lands of this description within the limits of Cadastral Survey have been mostly recorded as porampōke in the Settlement Register. But these are lands which, though not recorded as porampōke in the Settlement Register, fall under the above definition or are required to be treated as porampōke in the public interests.

III. *Tharīśu*. These are waste lands at the disposal of the government and are available for extension of cultivation consistently with the requirements of the public for communal purposes. These are surveyed and assessed or unassessed lands and recorded as tharīśu in the settlement records as distinguished from porampōke.

IV. *Thanathuchitta lands* are surveyed and assessed lands occupied by palaces and Sirkar temples or other govern-

ment institutions. They are surveyed and assessed and the tax fixed on them. They are virtually government land, and the Sirkar is treated as *paṭṭadār*, though no *paṭṭa* is actually issued. They are assessed to revenue as on *Paṇḍārappāṭṭom* lands and therefore the tax on such lands cannot be altered for 30 years from the date of settlement.*

The system of land tenures is based on the ryotwari principle, i. e., the principle of direct settlement with individual ryots. There are many and varied tenures under which these lands are held, the origin or meaning of each of which it is not easy to ascertain at this distance of time. Many seem to differ only in name, for; the same tenure would be known by different names in different localities. But they can be conveniently grouped under the following principal heads:—

Tenures of Sirkar
lands.

- (a) *Veṇṇpāṭṭom* or Sirkar *pāṭṭom* lands.
- (b) *Otti* lands.
- (c) *Anubhōgam* or *inām* lands.
- (d) *Viruṭhi* or service *inām* lands.
- (e) Miscellaneous.

Each of them is described below in some detail.

Veṇṇpāṭṭom or Sirkar *pāṭṭom* lands.

This is the most widely prevalent tenure and it is into this that all other tenures in Travancore tend to merge. This tenure was originally in the nature of a lease from the Sirkar. The lands under this head are liable to full assessment, or in the language of accounts, *Kanḍappāṭṭom*. Unlike the *Kuṭhakaṇḍappāṭṭom* lands, the *Veṇṇpāṭṭom* tenants have heritable and transferable rights. As waste lands are planted or otherwise brought under cultivation, they are registered as *pāṭṭom* lands subject to the full assessment. The extent of the lands under this tenure is gradually increasing. They are held on precisely the same terms as the ryotwari lands

* 43 T. L. R. 58.

on the other coast. They are in the absolute possession of the holders as long as the government demand is paid, but when this falls due, the land is liable to be attached and sold. Besides the waste lands that are being brought under assessment from time to time there have been accretions to this class of tenure from various other causes. The chief among them are :—

1. Properties belonging to favourable tenures escheated to Government.

2. The Viruthi holding granted by Mādāmpimār of old but which after the extinction of their powers and status as separate rulers was subsequently assumed by the Sirkar;

3. Properties reverted to the Sirkar after the death of individuals or extinction of families to whom they had been granted as a special case on favourable terms of assessment and afterwards assessed as pāṭṭom lands;

4. Lands purchased or acquired by tenants from jenmis or petty chiefs for money consideration and enjoyed by them as absolute property but subsequently escheated to the Sirkar as heirless;

5. Certain other tenures converted into Paṇḍāra-ppāṭṭom at the last settlement;

6. All lands of whatever nature of which the settlement pāṭṭom has been found to be either equal to or less than the old Munkāram have been changed into Paṇḍāra-ppāṭṭom;

7. All lands newly registered as Puthuval since the old Settlement have been assessed with full pāṭṭom and treated as Paṇḍāra-ppāṭṭom lands. So also the enfranchised service ināms are now merged in Pāṭṭom tenure;

8. Several pieces of waste lands belonging to incorporated dēvaswoms were registered as pāṭṭom.

Till 1040 M. E. the lands under this tenure were considered the absolute property of Government, the holders thereof having no proprietary rights, not even transferable rights of occupancy. As such the tenants had power only

to transfer their naḍavukūr rights, viz., rights of compensation for improvements, i.e., $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$ or $\frac{3}{4}$ of the gross assessment, the first, i. e., $\frac{1}{4}$ being of larger application than the rest. This state of things was found detrimental to the material progress and improvement of the tenancy as the tenants in their then condition found no incentive whatever to improve their holdings since they might be ousted and the lands transferred to others. This abject condition of the ryots drew the sympathetic attention of Government. With a view to place the interests of the agriculturists on a firmer basis a Royal Proclamation was issued in 1040 M. E. (1864-65 A. D.) conferring proprietary rights on the holders, who were since then entitled to transfer their lands by sale, mortgage, gift or otherwise, the only restriction being the payment to the Sirkar of an *ad valorem* fee of two per cent. on every transfer. This fee, known as the Pāṭṭom fee, was subsequently abolished.

One important incident of this class of tenure was that a small deduction was made in the assessment on garden lands. This was called the naḍavukūr or the planter's share, and this concession was allowed as in the case of the jenmom lands to induce the tenants to plant or otherwise improve their gardens. It secured to the tenant a portion of the profits accruing from the trees planted by his labour and at his expense and operated as a direct stimulus to improvement. The compensation was generally one-fourth of the Kandappāṭṭom, but there were also exceptional cases where this deduction extended to $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{8}$, or $\frac{7}{10}$ of the full assessment. These exceptional rates were due to the special consideration of difficulties or expensiveness of rearing trees on poor soil, or jungle tracts which had to be cleared. In course of time this system of deduction (naḍavukūr) involved complicate calculations and proved a source of abuse of power in the hands of the subordinate officials at each revision of assessment in every twelve years. There was great

latitude of action vested in the assessing accountants. While it complicated the accounts, it was no good either to the ryot or to the State. Hence with a view to simplify the accounts and remove one source of oppression to the ryots, the naḍavukūr was abolished at the time of the last revenue settlement of the State. A moderate scale of assessment of trees was introduced.

In the case of paddy lands a deduction of 20 to 30 per cent. was allowed permanently to compensate for adverse seasons of blight or floods of ordinary kind. In the case of extraordinary droughts or floods, special remissions were allowed. With regard to lands lying on the borders of backwaters or rivers, the pāṭṭom was remitted on fallows of alternate years once in three or four years. As the fallow remission determined on the oath of the ryots, the remission was called *sathyakkuravu*. Similar remissions are also allowed for blighted or withered crops in Nānjanād where the water-supply is sometimes deficient. Some of the lands under this tenure are also subject to various other deductions such as jenmikkaṛam, allowances for the maintenance of charity institutions, pagodas, dēśabhōgam, etc., such amounts being left to be paid direct by the tenants themselves.

Other kinds of pāṭṭom. Besides the Venpāṭṭom properly so-called there are certain other kinds of tenure.

(1) *Sanchayaṭṭom* or miscellaneous leases. All escheated viṛuṭhi holdings and those of incompetent viṛuṭhikār are leased out under this tenure on a higher pāṭṭom till another is appointed for such service. Lands that cannot be permanently leased out or whose tenure cannot be easily settled are treated under this tenure. The holders are mere tenants-at-will.

(2) *Durghāsu pāṭṭom* comprises pirthal lands leased out at a lower pāṭṭom for a specified or unspecified period. They are liable to higher assessment at the discretion of the Sirkar. These leases are generally for ten years or

less periods after which they are normally renewed. If the old lessee is unwilling to take it up once again, the lands are auctioned and given on lease to the highest bidder. This, however, applies only to wet lands. In the case of garden lands they are given on *kaṇḍappāṭṭom* if it is higher than the *Āyacut pāṭṭom* or on the *pāṭṭom* obtaining in the locality. Failing to get tenants on either of these conditions, the gardens are let out to the highest bidder.

(3) *Paṇḍārāvaka payattu pāṭṭom*. Under this tenure fall such lands as are Sirkar waste and unassessed lands with no taxable trees thereon. When these are brought under cultivation the tenants are liable to a *pāṭṭom* fixed by the Sirkar. When, however, the lands begin to yield, the tenure is changed and brought under *puthuval* or Sirkar *pāṭṭom* tenure bearing *Vrikshappāṭṭom* or tree tax till the next settlement.

(4) *Vetṭolivu pāṭṭom*. This tenure is common to Sirkar as well as to *jenmom* lands. In its demand the Sirkar makes a deduction equal to the interest on the amount spent for bringing the waste under cultivation. In the case of *jenmom* lands, the *jenmi* can redeem them on payment of the amount spent on improvements.

(5) *Mēlvāram, Vilanṭadi and Aḍiyara pāṭṭom*:—The cultivation of hilly tracts known as *chērikkals* in the taluks of Changanāssēry, Thiruvalla, Mīnachil Kōṭṭayam, Mūvāttupūḷa, Thodupūḷa etc. comes under this head. Once in twelve years the brushwood is removed and the ground cleared and sown with paddy or other grains. This cultivation is carried on for three years continuously. The first cultivation is called *Oḷavu* and the second and the third *Kala* and *Kūrunpūppu* respectively. The first two cultivations are generally paddy, while the third has sugarcane, tapioca or some other minor produce. For Sirkar lands the tax levied for the years of cultivation is $\frac{1}{10}$ of the produce and the *Paranel* and *Katta* for every *Chērikkal*, while in the *jenmi* tracts, the Sirkar is entitled only to one tenth.

These assessments are levied on measurements of cultivated areas made by the subordinate revenue officials at the rate of 2 fs. ($4\frac{1}{2}$ as.) for every para of Sirkar lands. It is half of that in the case of jenmom lands. However, in the slightly different adiyarapāṭṭom tenures, the jenmi having received an aḍukkuvathu or payment at the rate of 2 chs. (1 a.) per para of land, gets only $\frac{3}{20}$ of the produce as vāram in addition to paranel and katta. No vāram is then paid for Kuṟumpūpu cultivation.

(6) *Karikkūr pāṭṭom* includes waste lands intercepted by channel beds and valleys overgrown with shrubs, leased out for cultivation. In these cases, one-fourth of the assessment is deducted for the cultivator's trouble and the remaining three-fourth alone forms the government demand. The tenant acquires full rights over the land.

(7) *Pandāravaka Viruṭhi pāṭṭom* :—This is the same as Sirkar pāṭṭom and differs only in that it was once a viruṭhi for some service which was no longer required and hence discontinued as such and brought under the pāṭṭom tenure.

(8) *Pandāravaka puthuval pāṭṭom* includes the nirthal and waste lands given for improvement and cultivation. Tree-tax is levied for portions of the ground containing taxable trees, while mere payattupāṭṭom or ground rent alone is levied on the grounds containing no such trees.

(9) *Naḍupāṭṭom* includes such temporary leases to third persons of escheated properties pending inquiries into the rights of claimants, if any.

(10) *Viruṭhi Nērpāṭhi pāṭṭom* is a tenure in which one-half the pāṭṭom is allowed for some services and the rest paid to government.

(11) *Viḷakku pāṭṭom* includes such lands as were assessed to Sirkar as pāṭṭom lands, but were formerly given for lighting some temples assumed by the Sirkar. Similarly there are kalakappāṭṭom and pālpāyasappāṭṭom, for other services, in temples which were assumed later,

(12) *Mīṭeḍuppu pāṭṭom* is the tenure under which assessment is levied on the surplus of Viṟuṭhi lands.

(13) *Thōḷḷāṭṭom* is another tenure under which Sirkar forests were leased out for the supply of thōl or leaf manure for paddy fields.

(14) *Kuḷippullīṭhanathu* is a tenure peculiar to the Shērthala taluk and is so called from the settlement made on the assurance of the ayots themselves after the land was made over by the Cochin State in the absence of any accounts. They have been included in the category of jenmom lands by the decisions of the High Court.* But this view has not been accepted by the government. By their order dated 13-5-1930, the government ordered that such lands need not be subjected to kaṟampathippu. The effect of the aforesaid order is that the owners of such lands are in an anomalous position. They can neither claim the benefit of the amended Jenmi Kuḍiyān Regulation nor recover the lands from the Kuḍiyāns. The characteristics of these tenures are :— (i) The lands are from the beginning subject to the rājabhōgam tax, which is levied whether they are in the hands of Māḍampimār or others, and (ii) the Sirkar levies a rājabhōgam tax on $\frac{1}{8}$ and $\frac{1}{10}$ of Kaḍama and one keṭṭuthengu for every 33 coconut trees.

A few tenures of this kind in the frontier taluk of Shenkōṭṭa are known by various other names such as Japti-Ayanzufti and Ayan included in the Layan (or frontier) from certain historical causes. The first is so called because those lands were once attached by the British as theirs, but were given back subsequently as the frontier disputes ended in favour of Travancore. The second class comprises lands ceded by the British in lieu of Malayankulam Deśam lands given up by Travancore, while the third comprises accretions

* Padmanābhan v. Mādava Nāicker, 2 T.L.T.83; Krishna Kaimal v. Sankarā Pillai, 27 T.L.J. 181; Sri Nārāyaṇa Nampūthiri v. Paṛamēswarān, 28 T. L. J. 204; Padmanābha Panicker v. Kunchu Kurup, 28 T. L. J. 1108.

to Travancore from the outlying British district of Tinnevely on a demarcation of the boundary line when disputes arose. As a consequence of such origin, these three classes of lands still retain their *British Indian character* and are treated as such in the State accounts.

Similarly, there are some special tenures of this kind current in South Travancore. These are chiefly :—

- (1) The Sirkar Dēvaswom Pāṭṭom.
- (2) The Ūrāṇma Dēvaswom.
- (3) The Naṛasingamaṭham Pāṭṭom.
- (4) The Maṭham Nandāvana Pāṭṭom.
- (5) Thirumukhappāṭṭom.
- (6) Irayili Pāṭṭom.

The peculiarity of these tenures is that the full assessment is not demanded on behalf of the Sirkar except in the first in which case the full assessment is taken by the Sirkar as the dēvaswom expenses are defrayed by the State since the assumption of the institutions by the Sirkar. Under the other tenures a portion of the assessment is allowed for the purposes indicated by the names of the tenures and the rest goes to the Sirkar. The names merely indicate the original source of tenure which became converted into pāṭṭom in later times.

Otti Thēṭṭam and Kāṇom:—The next class of Sirkar land tenures for consideration is known as otti. The word itself means a mortgage and denotes a class of holdings by ryots by virtue of certain transactions in which a debt or money consideration has entered. It is in no respect different from a simple mortgage between a jenmi who borrows and a tenant who lends the money. In this tenure the Sirkar is the mortgager and the tenant the mortgagee, the consideration for the parties being either actual or constructive debt by the State or something equivalent to it. Traces of actual borrowing by the Sirkar for lands given by them are but rare and the drawing up of any instrument or the registering of any property on borrowing

a sum of money is not in vogue at present. Most of these tenures appear to have originated from :—

1. the Sirkar having conquered and taken possession of tracts including properties given over to the ryots by the rājās and petty chiefs of old for sums borrowed,

2. the Sirkar succeeding by escheat to the rights of any mortgager of property dying heirless, and

3. the Sirkar succeeding to the rights of certain chieftains whose properties were held by tenants for moneys advanced by them.

Aḍima, Anubhāgam, Thiruvulam and other favourable tenures not transferable by the holders have been treated by the Sirkar as otti for purposes of revenue when transferred to strangers for money consideration.

The lands under this head are charged with the full assessment but a certain debt is admitted by the Sirkar as being due from them to the owner or occupant of the lands for which they are bound to pay interest at certain rates, which interest is deducted from the pāṭṭom. The remainder plus the rājabhōgam constitutes the net tax payable on otti lands. The consideration for this kind of mortgage may be money due for admitted improvements effected on pāṭṭom lands or mere State debts actually borrowed from the ryots at the time the lien was created or money handed over by the chieftains of the principalities which have merged in Travancore, or debts or encumbrances due on escheats and on dēvaswom properties assumed by the Sirkar. The interest due by the Sirkar is estimated at rates varying between five and twelve per cent. according to the time and the circumstances when the obligations were contracted. Most of these, however, are several centuries old.

These lands unlike those of the venpāṭṭom tenure were all along considered the property of their holders who were therefore competent to alienate them at will. But the moment they pass out of their hands by sale, the conditions of the tenure become modified by a process called

ottivilakkam. The mortgage amount is reduced by 25 per cent., and the government demand enhanced by the amount of interest on this deduction. This process being repeated at every succeeding alienation leads to the ultimate extinction of the debt and the enhancement of the Sirkar demand to the full pāṭṭom. The restraint on free alienation operated as a check on the circulation of property and prevented the seller from obtaining the full value of his property. The prospective reduction of the principal by $\frac{1}{4}$ and the consequent enhancement of the pāṭṭom by the amount of the interest went to depreciate the value of the land. Hence it was evaded in practice by the transfers being never reported to the authorities. The rules concerning these tenures and their transfer were complicate and varied in different parts of the State. The above process of ottivilakkam did not obtain in all the taluks. Some taluks applied only to the tenures escheated to Government. Hence with a view to secure uniformity of treatment throughout the State, to relieve the ryots from the hardships caused by ottivilakkam and thereby remove the obstacles which it interposed to the free and unrestricted transfer of property, and at the same time to simplify the accounts, the process of ottivilakkam was abolished by Sec. 22 of the Settlement Proclamation of 1061. Rules were passed to the effect that no such debts would be recognised nor any reduction thereof or enhancement in the tax made.

By Section 22 of the Settlement Proclamation of 1061, it was ordered that properties held on otti tenure be treated as so many favourably assessed lands or ināms. They were to be assessed either with one-half the settlement pāṭṭom or the munkarām, whichever was higher. The otti tenures were accordingly converted into otti ināms in some taluks but in most others the old name itself was retained. As the munkarām, if it was greater than half the settlement pāṭṭom, was adopted as the government

demand, the proportion of the tax to the pāṭṭom in respect of this class of lands is now indefinite and the tenures themselves are known by various names. At the last settlement, personal ināms found in the enjoyment of persons other than the original grantees or their descendants were converted into otti. Similarly, jenmom lands belonging to māḍampimār, alienated for money consideration have been merged in the otti. Dēvaswom and Brahmaswom lands demised on irakārāṇṇa were converted by the Revenue Department into otti in pursuance of Huzur Sāadhanam No. 894 of 1074, while such transfers were subjected only to one-fourth of the pāṭṭom at the settlement as per Huzur Sāadhanam No. 5 of 1066. Jenmom lands demised on aṭṭippēr before the last settlement and described as paṇḍāra-vaka aṭṭippēr and assessed with rājabhōgam only were converted into otti and charged with one-half of the pāṭṭom at the last settlement when they were found alienated by their holders. But this process of conversion was not applied to the transfer of alienated jenmom lands convertible into kuḍijenmom. Dēvaswom and brahmaswom lands alienated without rights being reserved to the jenmi were converted into otti till 1066 when the practice was stopped. These lands were ordered to be converted into kuḍijenmom and assessed with one-fourth pāṭṭom.

I. Mēlotti or Mēlkāṇom is, as it were, a second mortgage by a jenmi with power to redeem the previous mortgage by paying his otti amount.

II. Purakkaḍam is a transaction recorded in a deed executed by the mortgager to the mortgagee for any additional sum that may be advanced to the mortgager after the first otti or mortgage.

III. Kōḍālivirūṭhi. In this case the tenant, instead of the micchavāram due to the jenmi has to fell trees or

supply fuel or do any other work with the *kōḍāli* or axe as desired by the *jenmi*.

IV. *Chōrā Otti* or *Milā Otti* is only a resort of the *jenmi* to permanently alienate his property and secure as high a consideration as was possible. As outright sales were considered derogatory to his status, the device was adopted.

V. *Thuyaṛā Otti* is a tenure in which the property transferred is never redeemed. It is just like sale.

VI. *Kayyoru Pāthi*. Under this tenure the *Ottikkāran* or *Pāṭṭakkāran* takes on lease a property and makes improvements in it on condition of his being entitled to one-half the cost of the trees reared by him, the other half being remitted in favour of the *jenmi*.

VII. *Otti* and *Kuḷikkāṇam*. In this instance, the *Ottikkāran* gets also the lease of a property, generally garden lands, for the payment of a certain sum of money called *Artham* and gets into the possession of the property for a period of not less than 12 years; at the time of redemption he is entitled to receive the amount back together with the *ponnu* or compensation for any improvements he may have made.

VIII. *Pāṭṭom* and *Kuḷikkāṇom*. This is more or less like *Otti* and *Kuḷikkāṇom* and applies mostly to government lands.

IX. *Attotti*. When a *jenmi* gives away his property to a *Kuḍiyān* on receipt of a sum of money equivalent to its worth without any provision for *Micchavāram* being paid to him, it is called *Attotti*.

X. *Nērotti-Nērpāṭṭom*. By this tenure the *jenmi* receives an amount from the *Kuḍiyān* which will secure him an interest which will be equal to the *pāṭṭom* of the property transferred. This can be redeemed, but it is seldom done as the money received, which will have to be returned, is the full value of the property.

XI. *Chittotti*. Under this an *Ottikkāran* gives his *Otti* property to another either for the amount he has paid

to the jenmi or a sum less than that ; in this case the jenmi can redeem his land only through the first mortgagee.

(c) *Ināms*. The next class of tenures are the *ināms* comprising *Aḍima*, *Anubhōgam*, *Thiruvuḷam*, *Thiruvada-yālam*, etc. They are grants of lands made by ruling princes, chieftains or great jenmis from time to time either for some service rendered or to be rendered to the State or sovereign or as a mark of royal favour. The term 'Inām' in the generic sense, is applied to all lands whether entire villages, such as *Śrōthiams*, *Agrahārams* or detached pieces of land held either entirely free of assessment or assessed on favourable terms. *Ināms* are known under different names in the several parts of the State and differ very much in their incidents and characteristics. They are of two kinds, viz., personal *ināms* and service *ināms*. *Ināms* granted for the performance of specified services are service *ināms*, while those granted for the support of individuals or families are personal *ināms*. The service grants are from their nature inalienable and are undisturbed so long as the prescribed services are performed and the assessment, if any, are paid. If the holder dies heirless, the *inām* is conferred on somebody else on the same conditions. The personal grants are of a charitable nature and given either as a reward for services rendered or as a mark of favour. They are of two classes, viz., (i) those which may not be freely transferred and (ii) those which may be freely transferred at the pleasure of the grant. The former, so long as they continue in the family of the holder, are kept undisturbed, but when they are absolutely transferred to another, they cease to be *ināms* and become subject to enhanced tax and are treated as *Otti* tenure for the purpose of calculating the assessment. The second class of personal grants may be transferred by sale, gift, or otherwise, the original tenure remaining unaltered. Of the personal grants some are rent-free altogether, while others are subject to the payment of either a quit-rent and a *rājabhōgam* or a *rājabhōgam* only.

With the commencement of the settlement operations throughout the State and with the abolition of the Ottaviḷakkam procedure for increased assessment at each alienation the following rules were passed:—

1. All service ināms to be left undisturbed so long as the services are duly performed subject to the payment of rājabhōgam at the rate of $\frac{1}{6}$ of the pāṭṭom and any micchavāram due, but when the services cease to be performed, the ināms are to be resumed and assessed with full pāṭṭom.

2. Of the personal ināms, those in the enjoyment of the original grantee or his heirs to be confined as ināms on payment of one-sixth of the pāṭṭom as rājabhōgam plus any micchavāram already due.

3. If, however, any such personal ināms be in the enjoyment of individuals or families other than those of the original grantee or his descendants, they should be charged with one-half of the pāṭṭom assessment, any micchavāram due being paid as usual.

After the settlement of the ināms under those rules, the holders shall be at liberty to mortgage, sell or transfer them at their discretion subject only to the payment of any quit-rent fixed.

Distributed with reference to the tax payable, the ināms were of three classes, viz.,

- (a) those free of tax,
- (b) those liable only to rājabhōgam; and
- (c) those liable to rājabhōgam and micchavāram.

The rājabhōgam rates and the micchavāram rates varied in different localities according to past usage.

Personal ināms themselves were of two kinds before the last settlement. They were (i) those that were liable to Ottaviḷakkam on alienation and (ii) those that were transferable without the risk of the original tenure or tax being interfered with. The former are dealt with in sub-sections 2 and 3 of Section 24 of the Settlement Proclamation and

the latter under "other ināms of a similar nature", detailed in Section 25. In accordance with the above provisions, a large proportion of personal ināms was brought under *pandāravaka otti inām* at the last settlement. The old accounts were not explicit enough to distinguish between the *rājabhōgam* and the *micchavāram* charged on the properties and therefore the sum total of the old *rājabhōgam* and the *micchavāram* has been treated as the old tax under orders of Government and fixed as the new demand wherever it exceeded one-eighth of the *pāṭṭom* fixed at the settlement. Most of the properties are for the above reason now found to be charged with more than the *rājabhōgam* rate.

The old distinction between the two classes of personal inām was done away with at the settlement. The holders of all personal inām lands are now at liberty to mortgage, sell or transfer them in any manner they please subject only to the payment of the quit-rent fixed. With regard to the settlement of service ināms, further instructions were issued by the Royal Proclamation of 1068 whereby it was laid down that "all alienation of inām lands attached to specific services of any description, which have been or which may hereafter be made, contrary to past usage, shall be treated as null and void. And it shall be competent to Our Government to resume the lands so alienated and re-attach them to the services".

The following are some of the ināms still extant:—

1. *Anubhōga Virūṭhi*. These are lands given to the *kuḍiyāns* or persons belonging to the same caste as that of the grantor, bearing a small rent or tax for their maintenance for no service of any description but simply as gifts to the good will of the sovereign. But in 24 T. L. J. 568 it has been interpreted to mean a personal inām or a service-grant. If it is for future services to be rendered, an alienation of such land by the grantee is null and void and the Government is empowered to resume the land.

2. Paḷanchōttu viṛuṭhi. These are gifts made for the maintenance of officers and domestic servants of the sovereigns in former days.

3. Māṇibham are lands granted to those persons who rendered good services to the State.

4. Arthamāṇibham includes inām lands charged with pāṭṭom only, the other half being remitted as compensation for services rendered.

5. Kaṣamōlivu Sarvamāṇibham. These are honorary grants made to persons of distinction for signal services rendered.

6. Aḍima or Anubhavam is a tenure of lands granted by rājās or petty chieftains generally to their domestics for cultivation for personal services past or future. An aḍima grant for past services is not resumable as it places the property at the absolute disposal of the grantee and the grantor is not entitled to any renewal fees whatever. Where the grant is for past as well as future services, the grant is to be treated to some extent for future services and the rest for past services.* Under the Proclamation of 1061, lands held on aḍima tenure are alienable.† Where the grantee of an aḍima tenure from a dēvaswom alienated the lands to one who for reasons of caste or otherwise was unable to perform the services personally (such as Christian), it was held that so long as the alienee was prepared through a competent person to perform the services attached to the land, the land was not resumable.‡ So under the very nature of the aḍima grant the liability to render services and pay the dues, if any, under the grant is imposed on the grantee personally and is not fastened to the property which forms the subject matter of the grant, since it is inconsistent with the theory of resumability. So the grantor cannot claim a charge on the property for his dues.§

* 25 T. L. R. 113, Valiya Rāja of Eḷayallūr v. Rāman.

+ 10 T. L. J. 227.

‡ 29 T. L. R. 45, Nārāyaṇaru v. Philipose.

§ Rāman Nampūthiri v. Thrivikraman Nampūthiri, 28 T. L. J. 1112.

7. Thiruvuḷam and Thiruvaḍayāḷam are lands granted by rājās or big jennīs to their domestics for some special reasons, for some kind of work. Thiruvuḷam grants were made ordinarily to women.

8. Guṛudakṣhiṇa are gifts offered by some sovereigns to their guṛus or teachers as rewards for educating the members in the royal family.

9. Ākṣhābhōgam includes lands given to some kuḍiyāns by the rājās and māḍampimār for rescuing them from dangers in perilous times.

10. Dēnapramāṇam are lands given to the Brahmans by rājās and other chieftains for ministering to their spiritual benefit.

11. Kuḍiyirippu are chiefly dwelling sites granted at pleasure, registered in the ryot's name, and bearing a light assessment, some times tax-free. The ryots have full rights in them and can alienate them as they like.

12. Kuḍumbapporuthy is purely a personal inām and not a service inām. The term 'Kuḍumbapporuthy' etymologically means provision for the support of the family. The administration of Śrī Padmanābhaswāmy's temple had been originally allocated to various functionaries called 'Maṭhoms'. Each 'Maṭhom' had its own lands, the income from which was to be utilised for the pūja and offerings to be performed in the temple. These lands were directly under the management of the Maṭhaṭhil Piḷḷamār and they constituted the agency to levy and collect the micchavāram due to the dēvaswom on these lands. At the last Revenue Settlement all the properties which till then were classified under the names of the different Maṭhoms were brought under one general designation as Śrīpandāravaka. The families of the Piḷḷamār held lands relating to the respective maṭhoms and these grants are known as Kuḍumbapporuthy grants. The grants were usually made in the names of the female members of the above families. In the grants to these families it is stated that the grantees and their successors

are to enjoy the lands for all time to come, without alienating them, as Kuḍumbapporuthy, paying the prescribed rent to the particular maṭhom in the temple. They were to be family grants for their maintenance in consideration of services rendered or meritorious conduct in the past. They were not made for future services. These families no doubt render certain services in the temple. But these services are duties devolving on them from olden times by virtue of their status as managers of the temple, for which they are entitled to special remuneration. Thus these grants are personal ināms and they have been enfranchised at the last settlement under the provisions of Section 24 of the Settlement Proclamation, and the holders of such ināms were given full proprietorship over them. So these lands are alienable by the holders thereof and the Government cannot resume them. The decisions in *Padmanābhan v. Nārāyaṇa* 16 T. L. R. 31 and *Viswanātha Iyer v. Nārāyaṇa Pillai*, 20 T. L. J. 1255, holding that Kuḍumbapporuthy grants may be either for past services or for future services require reconsideration in the light of the facts disclosed in the report * on Kuḍumbapporuthy lands published in 1935 and the Government order thereon. Mr. Rāma Iyengār, in his Settlement memorandum, referring to this tenure observes:—“These gardens are granted for certain families and are charged with rājabhōgam and micchavāram for both paṇḍāravaka and dēvaswomvaka grants. Ottivilakkam will be made when transferred from one head to another”.

13. Thirumukha Irayili or Aḍuṭhūṇ Irayili are other grants of lands by kings or chiefs for services rendered by the grantees or their ancestors who lost their lives in war. They descend to their heirs and representatives and are seldom resumed by the Sirkar.

14. Kuḍijenmom tenure obtains in 23 taluks. They include properties given for the maintenance of certain

* Mr. K. N. Kēśava Pillai's report on Kudumbapporuthy lands.

families. These correspond in a way to the jēnmom properties of Nampūthiṛi brahmins.

15. There are other inām tenures peculiar to the border taluk of Shenkōṭṭa. They are about five in number and are known as Dēvadāyam, Brahmadaṣyam, Umpalam, Ubhaya umpalam and Uḍama umpalam.

i. Dēvadāyam includes lands granted on light assessment for the performance of pūjas in certain temples. They were given to ryots for cultivation but they are inalienable.

ii. Brahmadaṣyam and Bhaṭṭavirūṭhi are grants made to Brahmins in former days. They bear a light quit-rent and may be alienated.

iii. Umpalam includes lands granted by rājās in ancient days on a light tax, for some services rendered.

iv. Ubhaya Umpalam includes lands given on light assessment in consideration of moneys borrowed. Rights over these are transferable.

v. Uḍama Umpalam are service grants given to śānthikkār and others in lieu of their salaries. The lands are lightly taxed, the holders cannot alienate them.

16. Maṇḍapakurathīrcha includes grants made to maṇḍapams or rest-houses for expenses to be defrayed when villagers meet for a common cause.

17. Nandāvanapram. These are favourably assessed lands given to certain families for the supply of flowers to temples. They are inalienable.

18. Maṭapram. These are lands granted for distributing water in rest-houses, etc.

19. Dwādaśipram are grants on a light tax for feeding Brahmins on dwādaśi days. The above three tenures are found chiefly in Shenkōṭṭa.

Viruṭhi. The next class of tenure is the viruṭhi, otherwise known as Irayili or Nāyar viruṭhi, and constituted kind of service ināms in the country. The viruṭhi holders were originally bound to render military service.

Originally these lands were given to Nāyars in return for service as soldiers in times of war. But when Rāma Iyen Daḷawa organised an army under D' Lannoy, this system was abolished and the viṛuṭhi holders were set apart for the service of dēvaswoms and ūṭṭupurās of the State. These lands were leased out at a light pāṭṭom in addition to rājabhōgam and were inalienable. The holders were entitled to undisturbed possession so long as they continued to discharge their services. The services obligatory on the owners of viṛuṭhi lands consisted in supplying at certain fixed prices vegetables, etc., required for the feeding houses as well as on occasions of particular festivals in the pagodas and certain ceremonial occasions in the royal household. They had also to provide sheds and find supplies during royal tours, thatch certain public buildings, assist the prowerthy officers in the collection of kist and perform other miscellaneous functions. They received advances from the public fund to supply provisions and settled accounts later on producing vouchers for the delivery of the provisions or for work done. The Nāyar viṛuṭhis are free from all other taxes except rājabhōgam quit-rent plus a fee called chumattu paṇam which varied from 1 fanam ($2\frac{1}{4}$ as.) to 3 fanams ($6\frac{1}{2}$ as.) for every viṛuṭhi holding, being the commuted value of a load of vegetables which each viṛuṭhi holder was bound to bring. When a viṛuṭhi holder made default in the performance of his service, he rendered himself liable to fine which might extend to a year's pāṭṭom of his holdings, and if he failed to resume his service, the holding became liable to resumption by government and transfer to another. When a viṛuṭhi holder died the lands passed to his next legal heir who must take up the service inām subject to the payment of a succession duty and certain fees to the Sirkar on receipt of which the land was registered in his name. These fees were:—

(i) Aṛayāḷam which was 50 per cent. of a year's rent or pāṭṭom in the case of garden lands and $2\frac{1}{2}$ fanams (5 as.) for every para in the case of paddy lands.

(ii) Aḍukkuvathu which amounted to 10 fanams (about $1\frac{1}{2}$ Rs.) and was meant for the grant of the Royal Niṭṭu or commission.

(iii) Niṭṭu paṇam which also amounted to 10 fanams (about $1\frac{1}{2}$ Rs.) and was meant for the preparation of the Royal Niṭṭu or commission.

(iv) Vanchikay paṇam equal to $2\frac{1}{2}$ fanams (5 as.) being the fee due to Śrī Padmanābhaswāmy.

(v) Chiṭṭippaṇam equal to one fanam being the fee for receipt given. If a Viṛuṭhi holder's family became extinct by failure of heirs, the tenure was either transferred on payment of a higher Aḍiyara fee or sold in auction to the highest bidder. The Aḍiyara or premium to be paid was generally a year's rent or pāṭṭom. This tenure was found in all the taluqs of the State except Thōvāla, Agasthīswaram, and Shenkōṭṭa. The general duties of the viṛuṭhikkār were, as already stated, to supply provisions for the five ceremonies at Trivandrum and for the utsavams in the several temples as well as ūṭṭupuṇas or feeding houses.

In course of time the system lost much of its vigour and elasticity. The condition of the holder of Viṛuṭhis had greatly declined owing to their services having been requisitioned for more purposes and on more occasions than those originally fixed, and owing to the high increase in prices and wages of labour, while the viṛuṭhikkār were paid only at the old rates fixed so many years ago. The recurring demands on them for failure of supplies or services made by the Sirkar servants added to their sufferings and rendered their condition quite abject and miserable. The sufferings of this class of people by exactions of the officers under colour of demands for public exigencies very early attracted the attention of Government. Action to relieve them or alleviate their sufferings was taken by Dewan Rāma Iyengār, who, issuing a number of queries to the many experienced officers of His Highness' service and to other well-informed men in the State, obtained detailed and

exhaustive information on the abuses, inconveniences and unsuitability of the old *viruthi* system to modern civilised times. The consensus of opinion in favour of its abolition then obtained was not, however, availed of for any practical action in connection with the settlement operations which were then inaugurated. The settlement of this question was reserved for future years. The question was again taken up in 1063 M. E. (1887-88) and rules were then passed freeing the *viruthi* holders from the supply of provisions to *uttupuras* and temples in the mofussil stations and confining their duties to all personal services as of old and to supplies of provisions and materials in connection with the five annual festivals, the sexennial *Murajapam*, and other ceremonials of an occasional or exceptional character at the capital or other demands of a customary nature. This state of things was not, however, allowed to continue long and the progress of Revenue Settlement work demanded a final solution of how these tenures and lands should be dealt with. Accordingly rules were passed to discontinue these tenures except in a few exceptional and indispensable cases, the lands being registered as *pāṭṭom* lands in the names of the former holders on payment by way of *vilayartham* (or the value amount). This *vilayartham* was calculated as follows:—

1. If the possession extended to 50 years or upwards, the *vilayartham* payable should be 25 times the annual assessment or *pāṭṭom*;

2. If the possession was for more than 25 years and less than 50 years, 30 times the *pāṭṭom* should be paid.

3. All others below 25 years' enjoyment were to be auctioned to the highest bidder. Exceptional cases, however, were to be treated at the discretion of Government. This procedure was adopted in some taluks where the settlement operation was completed and many properties were registered as *pāṭṭom* on payment of *vilayartham* or sold in auction and the proceeds credited to Government.

There are some *viṛūṭhikkār* of a special kind whose services are confined to a particular supply or service in the local temples. They are chiefly:—

1. *Kūṭhuviṛūṭhi*. These are lands given to *Chākyārs* and *Nangyārs* for the performance of *Kūṭhu* or story-telling in temples.

2. *Koṭṭuviṛūṭhi*, *kuḷalviṛūṭhi* and *kompuviṛūṭhi*. These include lands given for beating drums or blowing trumpets in temples.

3. *Vaḷḷaviṛūṭhi*. This comprises lands given for bringing boats for festivals and ceremonies. This is chiefly in the *Ampalapuḷa* taluk whose early kings known as the *Chempakaśēry Rājās* had made large grants for festivals and ceremonies in the royal household and the *Śrī Krishṇa-swāmy's* temple at *Ampalapuḷa*.

4. *Ānaviṛūṭhi* and *Mānaviṛūṭhi*. These are lands given for the supply of elephants and garlands of flowers to the temples.

5. *Śānthiviṛūṭhi*. These are lands given to Brahmins for *śānthi* or *pūja* in the temples.

6. *Kayarviṛūṭhi*. This includes lands given for the supply of the *Koḍikkayaru* or rope for hoisting the flag during the *utsavam* and in some cases for drawing water from wells, etc.

7. *Thaliviṛūṭhi* or *Chauluviṛūṭhi*. These are grants to *Ampalavāsis*, etc., for sweeping and other menial work in the temples.

8. *Pāṭṭuviṛūṭhi*. These are lands given for *kaḷam-eluṭhu* (drawing the image of the Goddess and singing her praises) in *Bhagavathi* temples.

9. *Pālviṛūṭhi*. These are lands given for supplying milk to the temple.

10. *Kiḷālmaviṛūṭhi*. These are lands given to low caste people for supplying *kothumpu* and other things for festivals in certain temples.

11. Chempuviṛuṭhi. These are lands given for the repair of copper vessels in the temples.

12. Kūravīṛuṭhi. These are lands given for supplying the koḍikkūra or flag for the koḍiyettu ceremony in the temples.

13. Śankhuvīṛuṭhi. This is given for blowing the conch-shell in the temples.

14. Mahābhāratha vīṛuṭhi. This is given for reading Mahābhāratham and other purāṇas in temples.

15. Naḍakāval vīṛuṭhi. This is given for guarding the temple gates.

16. Veḍivīṛuṭhi. This is given for fire-works during utsavam and other ceremonies in the temples.

17. Paṛisavīṛuṭhi. This includes lands given to some of the taluk subordinates called paṛisakkār for their work.

18. Kacchavīṛuṭhi. These are lands given for military training.

19. Munnila vīṛuṭhi. These are grants of lands assigned to munnilakkār or foremen of villages for helping the proverty officials in collecting taxes etc.

20. Pāliyaṭhu Mēnon vīṛuṭhi. These are grants of lands in this State made by the Pāliyaṭhu Mēnon for services to his family.

21. Koḍungallūr vīṛuṭhi. These are grants made by the Cranganore Rāja for performing some special service. They were held by Travancore ryots.

22. Perumpaḍappuswarūpam vīṛuṭhi. These are grants by the Cochin Rāja to some of the Travancore subjects for some service or other.

These several minor vīṛuṭhi holdings are now only of historical value inasmuch as they are not extant. They mostly pertained to the several mofussil temples in the State which have since been assumed by the Sirkar, when many of these holdings were assessed to revenue. Other arrangements being made by the Sirkar for the services formerly rendered by these vīṛuṭhi holders, and such of

them as still exist are sure to be done away with when the next settlement is carried out.

Miscellaneous tenures.

(i) *Panḍārāvaka Kuḍijenmom* represents land of which the Kuḍi or the subject exercises jenmom rights. The characteristics of this tenure as gathered from the early settlement records are: (a) Anjāli cess was imposed in the lands under this tenure. (b) Lands held under this tenure were converted into otti on alienation. (c) When the holder of a Kuḍijenmom land violated a rule of social custom in defiance of Royal commands, the land was confiscated and given out as panḍārappāṭṭom. (d) In the earliest settlement Kuḍijenmom was assessed with one-sixth assessment and in later assessments in various proportions of the full assessment.

ii. *Kāramo!ivu*. Under this head are included all lands, other than jenmom, which are tax-free. These comprise the tax-free tracts situate within the limits of the State and not included in the Eḍavakais, detached pieces of land within the limits of Sirkar villages, belonging to individuals and institutions which are held tax-free, and grants under dānom and other tenures which enjoy immunity from taxation at all events.

(iii) *Sirkar Devāswomvaka lands*:—The lands under this head originally formed the jenmom or private property of the Devāswoms prior to their absorption in the State accounts. They were mostly held under Venppāṭṭom tenure. There were also, to a limited extent, other tenures like those created by the jennis. The transactions involved in Sirkar devāswom tenures were thus analogous to those of Sirkar lands and the same principles and methods of settlement were applied to both classes of lands alike. When the management of those devāswoms was taken up by Government in 987 M. E., the revenue derived from them was added on to the State revenues. Although the lands belonging to these devāswoms were to all intents and

purposes treated as Sirkar, the distinction between Sirkar lands and Sirkar *dēvaswom* lands was kept up to some extent during the last settlement. But large extents of *dēvaswom* lands have been, partly through mistake and partly through error or misconception, recorded at the settlement as Sirkar or *paṇḍāravaka* lands. However, in 1088 M. E. an attempt was made to separate the Sirkar *dēvaswom* lands from Sirkar lands and separate accounts were ordered to be kept. In regard to lands wrongly entered as *paṇḍārappāṭṭom*, the following instructions were laid down in G. O. No. 14721/L. R. and F. dated 25-12-1913:—

“In every case in which a land belonging to Sirkar or private *dēvaswom* as its *jenmom* is proved beyond doubt to have been registered as *paṇḍārappāṭṭom* in the name of a stranger, the registry would ordinarily be left alone, but an amount equal to what the *dēvaswom* or other owner would have realised as rental on the land but for such wrong registry, would be paid to the *dēvaswom* or other owner from the public treasury till the next general revenue settlement, so that in the event of *paṇḍārappāṭṭom* tax on the land being less than the amount so made payable, the Government may be in a position to raise the tax to the level of the latter sum”. As this policy created discontent among the holders of those lands, it was abandoned by the Royal Proclamation of 1097. This Proclamation declared all Sirkar *dēvaswomvaka* lands as *paṇḍāravaka* and placed the holders of the former in the same position as the latter. The Sirkar *dēvaswom* revenue has merged again in the State revenue as the result of the changed policy. In the next settlement there will be no Sirkar *dēvaswomvaka* tenures since by the Royal Proclamation of 1097, all Sirkar *dēvaswomvaka* lands have been declared *paṇḍāravaka* lands. Nevertheless, they are important as they formed a distinct class of tenures and as their transformation into *paṇḍāravaka* was made only to serve the larger interests of the public.

(iv) *Kuṭhakappāṭṭom lands*:—Originally these comprised such lands as were specially the Sirkar's own, but were held by the others on contract or lease. They are either purchases or acquisitions made by the state and as such were treated separately. The purchases and separate acquisitions comprise, according to Āyacut accounts, the Paḷlipōrt farm, the Puḷinthuṟuṭhu lands, Arthungal lands and the Kaḍukaval lands. The first two have now been registered and settled as paṇḍārappāṭṭom lands. Now Kuṭhakappāṭṭom means and includes:—(i) leases of government land which cannot be permanently assigned away, (ii) lease of trees standing on government land, (iii) leases of porampōke land on fixed ground-rent for putting up shops in bazaars and markets, (iv) leases of government land for temporary occupation in connection with fairs, festivals, marriages, public entertainments, etc. The Kuṭhakappāṭṭom leases fall under two classes:—(1) leases for definite periods, and (2) leases without limit of time. The latter include (a) lease of trees on porampōke lands given without limit of time before 1914 and those given thereafter without limit of time under the rules, (b) lease of shop sites in bazaars on fixed ground rent. The lessee has only a right of enjoyment. He has no right to alienate his interest without previous sanction of government. He is liable for damages caused by his neglect. The lease could be revoked at any time by government if required for government or public purposes.

(v) *Thiruppuvāram*:—Thiruppuvāram is the assignment in favour of a third party, of a specific portion of the revenue payable to the government by the holder of a specified land. These assignments are some of them very old. The circumstances under which they were made cannot now be fully traced in all cases. In some cases, the thiruppuvāram represents probably the interest on money lent to or due by the Sirkar. In others, it is probably the micchavāram due to the jēnni of a property by its tenant, when the

interests of latter (alone) lapsed to the government by escheat or otherwise. In other cases again it is probably an allowance or gift to religious or charitable institution. There is also another class of cases in which it is a remuneration for services to be rendered in certain Sirkar temples. The procedure, however, in all *thiruppu* cases is the same. The *thiruppu*-holder collects the *vāram* direct from the holder of the land on which it is charged. In case of default, payment is enforced by a civil suit.

(vi) *Kaṛaṭhil-chilavu* :—This literally means “expenditure out of the land revenue”. It is, in effect, an assignment of the whole or of a specific portion of the revenue due on land, generally in favour of its holder. The amount assigned used to be neither actually collected from the holder nor paid to him but it was fictitiously entered in the accounts as collected and then paid. As in *thiruppuvāram*, the general question of *kaṛaṭhil chilavu* was not considered, nor was any definite policy laid down in regard to it, at the time of the revenue settlement. The matter came up before the government in 1083 M. E./1908 A. D. It was then felt that the *kaṛaṭhil chilavu* arrangement was not compatible with the new system of accounts and that it should be done away with. The government accordingly laid down, in their order No. 1009/L. R., dated the 8th August 1908, that in a case like this the whole of the settlement tax should be recovered from the *paṭṭadār* and that, whatever amount he was entitled to on account of *kaṛaṭhil chilavu*, should be paid to him from the public treasury.

Śrīpaṇḍāravaka lands :—*Śrīpaṇḍāravaka* lands are lands belonging to the *Śrī Padmanābhawāmy* temple. These lands and the income therefrom are shown separate in the State accounts and are separately managed. They were formerly in the possession of the *Maṭhaṭhil Pillamār* who paid the *micchavāram* to the temple. Subsequently they have been resumed and given to the *ryots* direct by the *Sirkar*. Of these some are given as *Anubhōgam* to persons

attached to or connected with the temple and the greater portion to the kuḍiyāns on high pāṭṭom in addition to a rājabhōgam of an eighth of the pāṭṭom. The collection is made by agencies different from the ordinary revenue officers. The payments were wholly in kind made under the supervisor or of two Tahsildars—the Mēlkangānom Tahsildar and the Sankētham Tahsildar. Under the present settlement, one-fourth of these dues is allowed to be paid in money in the taluk of Nānjanād. The tenants have full rights in these lands and they can mortgage, sell or otherwise alienate them as they like. No ūḷiam service is attached to them as in the case of lands belonging to temples.

There are service inām lands of the Śrī Padmanābhawāmy temple (Śrīpanḍārāvaka) granted to the families of certain dignitaries and servants of the temple for services to be rendered. They are not alienable. Compensation is now provided to be paid if and when the lands are resumed. Mathilakam Service Inām Proclamation of 1110, abolished these ināms. The services are now paid for in money. The lands are enfranchised and converted into Śrīpanḍārāvaka pāṭṭom on full assessment at the rate fixed at the settlement. The important provisions of the Proclamation are:—(i) Of the assessment charged $\frac{1}{8}$ shall be treated as rājabhōgam and the balance as land revenue; (ii) The land shall be registered on levy of a vilayartham of 25 times the full assessment on all wet lands and garden lands outside Trivandrum Municipality or at the rate of Rs. 10 per cent. on garden lands within the Municipality; (iii) The land shall be registered in the name of the family to which it was originally granted, if it is in their possession, or, if partitioned by the family, to the members to whom it is allotted; otherwise in the name of the alienee or mortgagee, if the equity of redemption has been lost to the original family.

PART II—LAND TAXES

Taxation in the modern sense of the term did not exist in early Travancore or the whole of Early History. Malabar. The original jenmom lands were free from tax and it was long before Sirkar or Paṇḍāravaka lands came into existence or the alienated jenmom properties were made liable to rājabhōgam. These were of gradual origin and growth as already set forth in the early portion of this chapter. The several petty principalities into which the country was originally divided were separately governed and the dues to Government, wherever they existed, were collected in different ways as suited to the habits of the people or the tastes and conveniences of each chief. Thus in no two principalities did the tax or the mode of taxation and their collection agree. A large part of the State property was alienated by the chieftains to religious and charitable institutions. Hence even after the country was consolidated into a whole, the systems obtaining in the several places continued for a time until uniformity, as far as possible, was extended to the taxes and their collection. Coins and minting were almost unknown in ancient days nor could it have been possible to have a uniform coinage in the several petty states. This must have to a large extent contributed to the continuance for a long time, of the early and primitive form of paying the Sirkar dues, namely in kind. It was first the tenant paying the master's share or the produce of his labour on the master's soil. With the advance of time and the introduction of coins, payment in kind gave place to payment in money.

The basis of Sirkar taxes. The first settlement of which we have any record is that of 948 M. E. (1772-73), which applied to all cultivated areas both fields and gardens, but it could lay no pretensions to accuracy as it was but a Ketṭelūthu or

Survey and
Settlement.

record of what was 'heard' or at least obtained by personal conference with the holders of land. A few stray and mutilated records relating to this settlement are even now available, from which it can be gathered that in North Travancore a coconut tree was taxed uniformly at 2 chuckrams. The next settlement was in 978 M. E. (1802-03) or 30 years later, which also comprised both fields and gardens. In this also no actual measurements were taken, but the area and assessment were fixed by local inspection and information. In the case of rice lands, an estimate was made of the seed capacity of each field in terms of the para and the area and assessment of each field was fixed on the basis of this estimate. The assessment on wet lands was, with a few exceptions, made payable partly in paddy and partly in money. In the case of garden and dry lands those that contained trees were generally subject to a tree tax which was also fixed both in kind and money. In some localities both the tree and the ground were simultaneously assessed to revenue. Pure dry lands which contained no taxable trees were assessed on their seed capacity. The tax for coconut trees was raised to 3 chs. in north Travancore.

There was another settlement in 993 M. E. (1818) which comprised only the garden and dry lands. This was carried out more or less on the lines of the previous settlement by the revision of the assessment of such of the holdings as were in a position to pay enhanced assessment. The other main changes effected were the adoption of a classification of the coconut trees in north Travancore and the abolition of the Naḍavukūr* remission. Subsequent to this settlement and before the next one the following prominent changes were made in the Land Revenue administration of the State. (1) The assumption of a large

* Literally means the planter's share. This was a deduction from the pāṭṭom or gross assessment which used to be made in favour of the holder of a garden land generally of the pāṭṭom tenure, on account of compensation for improvements made by him.

number of private *dēvaswoms* and their properties by the Sirkar; (2) The introduction of certain standards of measurement for wet and garden lands; (3) The introduction of a system of remissions for the punja lands of the *pāṭṭom* tenure in north Travancore which were periodically left fallow; (4) The incorporation of the Panthalam Chief's lands with the Sirkar lands under an agreement with the chief; and (5) the restoration of the system of *naḍavukūr* remissions abolished by the prior settlement.

The next settlement was in 1012 M. E. (1837). This was also confined to garden and dry lands. The taking of field measurements and the adoption of different rates for the different classes of coconut trees in north Travancore were the distinguishing features of this settlement. In the southern taluks not only the coconut, jack and areca, but also the palmyra, punna, tamarind, mango and iluppa were assessed to revenue. The assessment, however, was based on no uniform principle and consisted of numerous and varying rates for each kind of tree in each taluk. The tree tax was generally payable in money, subject to certain exceptions in the case of coconut and arecanut trees for which taxes known as *thēngāppāṭṭom* and *pāḷkkupāṭṭom* were fixed in kind at so many nuts per tree. In some cases a certain percentage of the coconut trees was set apart for the supply of oil too. This was known as *kettuthengu*. A system of field measurement was for the first time introduced. The dimensions of the garden lands liable to ground tax were measured with a rod of 10 English feet and their areas calculated and recorded. But in the case of gardens subject to tree tax the side measurements were alone recorded. The ground tax was rated at so much per para of *payattupāḍu**, each para being assumed to be equivalent to

* This was the extent of dry land that could be sown with *payaru* or red gram. A para of *payattupāḍu* land means the extent which can be sown with a para of red gram.

640 square rods. In south Travancore the 'plough standard' was adopted which represented the extent of land which could be brought under a single plough in a day. This was equivalent to about 71 square rods.

The records of the surveys held at these two settlements did not give with any accuracy the area of each holding, its exact boundaries or the classification of the soil. Both the area and assessment were given in a rough way in estimated quantities of the seed required to sow each field; and the process of calculation of Sirkar revenue was subject to so many variations and deductions under an intricate and unsatisfactory system of revenue administration that the officers responsible for the collection found no small difficulty in dealing with individual cases. There were no field or village maps or sketches of any kind. The revenue accounts were not brought up to date with the transfer of properties registered and as such even the subordinate revenue officials could not know on whom to call for the payment of any arrears due. Much less could the ryot know in these circumstances the extent of any particular field or holding. No unit of measurement was recognised or followed. There was inequality of assessment prescribed without any reference to soil, facilities of cultivation or the produce grown thereon. In some taluks the Sirkar demand was so excessive that the ryots were hardly able to derive a bare subsistence from the land and the first adverse season reduced them to a struggle for existence. The periodical revision of garden lands and the consequent increase of Sirkar revenue once in twelve years, contemplated in the settlement of 1012 M. E. (1837 A. D.), were not being properly done and hence much revenue that should have accrued to the Government on account of the new plantations were lost. These and other drawbacks and difficulties called for a proper remedy. Accordingly in 1876-77 a special department was organised to study and report on the question. One or two small tracts of country were then

experimentally surveyed. The principles of settlement were discussed and certain proposals made. But the final decision took some more time. Further investigations were made in the meanwhile and Rāma Iyengār, the Dewan, drew up an elaborate memorandum on the subject. It was resolved to carry out a careful survey of the whole State, which was to be followed by a Revenue Settlement. These were inaugurated by a Royal Proclamation dated 14th Kumbhom 1061, 24th February 1886.

The main features of this new survey and settlement were then declared to be accurate measurement, demarcation, mapping out, valuation of properties of every description and registration of titles as the basis of sound revenue administration. Unlike the previous attempts this survey and settlement was to extend to the whole area of the State including the waste, uncultivated and unassessed tracts as well. A uniform standard of land measurement in acres and cents and of grains in paras and eḍangalīs was laid down. Many old cesses were abolished. The old complicated tenures were simplified. Garden assessment was made permanent without periodical variation. The system of naḍavukūr and the tax in kind from gardens were also abolished. Many taxes were made uniform throughout the State. The ināms were ordered to be settled with due regard to their character as personal or hereditary grants. Possession by the original grantees and their heirs was treated more favourably than possession by strangers. It was further provided that on settlement being made each landholder should be provided with a paṭṭa showing the particulars of his land, the assessment due thereon, the deductions therefrom, the net demand, the kists or instalments and other items. This settlement was declared unchangeable for 30 years. In pursuance of this proclamation the Survey and Settlement Departments were organised. The settlement was completed by the end of Mithunam 1085 (July 1910). The cost of this Survey and Settlement was 42

and odd lakhs of rupees and the operations extended over a period of nearly 28 years. The main items of works in the settlement operations were : (1) Classification of the lands, (2) Registration of titles, (3) Final Settlement and (4) preparation of the Settlement Register and other final records.

Revenue Survey.—Cadastral Survey, as the basis of the Revenue Settlement was, for the first time, introduced in Travancore in 1058 M. E., and it was conducted on the lines prevalent in the Madras Presidency. Four systems were used one after another and they are :—

(i) Tak system or the Triangulation system. No distinction was made under this system between revenue and survey fields and each holding was demarcated and separately surveyed into triangles. The chances of error under such an arrangement were small. The survey maps prepared under this system facilitated ready reference and early verification.

(ii) Base lines and off sets. This was introduced towards the close of 1063 M. E. Under this method a distinction was made between survey fields and revenue fields. Several fields were clubbed together up to an extent of 6 acres in wet and 12 acres in dry lands to form survey fields, the revenue field being separately marked in the sketch book. The bends and trijunctions on the boundaries of revenue and survey fields were fixed by off sets from lay chain lines running between Khandom stations and certain intermediate points where necessary. This system proved defective in respect of gardens which were assessed in the number of trees grown.

(iii) System of triangles and off sets. It was introduced in 1078 M. E. and all the lands were subsequently surveyed as per this system. The survey field was split up into large triangles and off sets taken up to the bends on the sides of survey fields and revenue fields within each. As per these systems each village was mapped and surveyed and the following records were supplied to the Settlement

Department: (1) Field Register showing the survey number, area, tenure and owner of each field. (2) Field measurement book showing the measurements of each field; and (3) map plotted to scale showing survey and revenue fields with important topographical details. After that, the Settlement Department began the settlement operations.

Assessment and land-taxes:—On this subject we have to consider the assessment of lands made for purposes of Sirkar revenue. The system of taxation in Travancore has, from the earliest days, been to assess the land or fix the full pāṭṭom amount or revenue as if the property was a Sirkar or venpāṭṭom land liable to full assessment and then ascertain the portion of it which was taken as the Sirkar revenue with reference to the nature of the particular tenure or holding. The mode of fixing the assessment according to sections 3, 12, and 16 of the settlement proclamation is to estimate the gross produce per acre of land on the best possible date and deduct therefrom one para for the seed sown and an equal quantity for the expenses of cultivation. From the remainder one-third is deducted for the cultivator's share and the remaining $\frac{2}{3}$ is divided in the proportion of $\frac{1}{10}$ to government and $\frac{1}{10}$ to the land-holder. The processes employed are :—(i) classification of the soil into classes and grades, (ii) determination of the grain out-turn of each class and grade of soil in some standard staple grain, (iii) determination of the cultivation expenses, (iv) fixing up of the commutation rates, (v) conversion of the grain out-turn into money and (vi) determination of the cultivator's and proprietor's shares.

Formerly this assessment was arbitrarily fixed in different ways in different taluks as a consequence of which there was inequality of assessment not based on any rational principle. It was very heavy in Nānjanād being about Rs. 18 or 16 per acre, and generally heavy to the south of Trivandrum, while in the north it was only double the quantity of seed on an average. The rates in the south some times went

up even to ten times the seed, though the average was only five. Wherever the rate went up to above ten times, it was reduced to that level. Even as it was, the average rate of Sirkar assessment in the south was double that in the northern taluks. But taking the productive capacity of the fields which are between 7 and 8 times the quantity of seed sown in the north and between 12 and 15 times the quantity of seed sown in the south, the burden of taxation in the north was a fourth of the produce, while it was a third in southern taluks. This inequality was not based on any rational principle and accordingly in the last settlement (i.e., of 1061) the rice lands were examined and classified with reference to soil, situation, production and other factors and the assessment was calculated according to the method above described. The Sirkar rate was fixed according to the scale sanctioned for each class. The wet lands are thus divided into 13 classes with varying rates of assessment. The following table shows the produce and the assessment or rent for the 13 classes of lands for single and double crops:—

Rates for wet lands for 1 para or 14 per cent. of an acre.

Produce.			Pattom or rent for single crop.		Rent for double crops.	
Class.	Paras.	Edangalis.	Paras.	Edangalis.	Paras.	Edangalis.
1	19	...	7	...	10	5
2	17	...	6	...	9	...
3	16	...	5	5	8	2½
4	15	...	5	...	7	5
5	13	...	4	5	6	7½
6	12	...	4	...	6	...
7	11	...	3	5	5	2½
8	10	...	3	...	4	5
9	9	...	2	5	3	7½
10	7	...	2	...	3	...
11	6	...	1	5	2	2½
12	5	...	1	...	1	5
13	3	...	...	5	...	7½

On working according to the above rates in some taluks, the rate of tax fixed was found to differ very much from the old rate. The Government therefore ruled that the amount of the old tax also should be considered as a prominent factor in fixing the new assessment. This rule was strictly adhered to. The assessment on a double crop land was calculated at $1\frac{1}{2}$ times the single crop rate and the amount was divided between the collection of each crop equally. No additional tax was demanded even if a third cultivation was made. It is worthy of mention that the double crop rate is demanded only for lands registered as such in Sirkar accounts; the single crop lands bearing a second crop in any year not being made liable for the additional demand unless it must have been regularly cultivated for two crops for a series of years. There must also be certainty of income from the second harvest before the land is recorded in the accounts as double crop land. This is probably on the ground that in the case of such lands a double crop is not always a real or substantial advantage to the ryot. The assessment on paddy lands was fixed in grain and not in money. Then it was partly in grain and partly in money. It has now been commuted into money payment.

Payment in kind or in money :—The assessment on lands as already stated, was in paddy and was in old days collected all in grain. What the cause of it might have been is not now easy to decide with accuracy. Probably the absence of a uniform coinage when the country was yet a group of principalities and other causes mentioned at the beginning of this chapter might have tended to its continuance for a long time. Dewan Rāma Iyengār observed in his learned memorandum that “much of the state property had been alienated in favour of religious or charitable institutions and naturally the wants of those could be better met by contributions in kind than by payment in money. Besides, such payments must have suited the pockets of a poor rural population better than money payments at a time when

money was scarce and its purchasing power just the opposite of what it had been in the past quarter of a century. But in course of time a decline in the value of money and a rise in the prices of articles have turned the tables and rendered the continuance of the present system unsuited to modern times". This tendency of the times was perceived by the government early enough and changes were introduced. This was done gradually so as not to take the people by surprise or inconvenience in the matter of supplies to the religious or charitable institutions. Thus a fourth of the paddy tax was first converted into money and then one-half. This was not, however, introduced uniformly throughout the State on account of the varying conditions of the different localities, and hence in different taluks different proportions prevailed; in the same taluk too sometimes different rates existed for different villages and these proportions were often changed by special orders issued from time to time. In the settlement of 1061 these proportions were uniformly fixed for the whole State, which were with certain exceptions, at one-half for the Trivandrum and Padmanābhapuram divisions, while they were one-fourth in kind and three-fourths in money for the Quilon and the Kōṭṭayam divisions. But by a later Proclamation dated 13th Karkaḍakam 1064 M. E. (27th July 1888) these exceptions ceased to exist. By a G. O. dated 20th Makaram 1081, payment in kind was wholly abolished and a commutation rate of 11 chs. per para was fixed and the landholder directed to pay the tax at that rate from Chingam 1082.

Remissions may be seasonal and non-seasonal. The former kind is confined to wet lands in certain particular tracts alone* and may be for total failure of crops due to drought (*karivu*) or the lands being left fallow owing to deficiency of water for cultivation,

* For full list of such tracts see pp. 278-297 Vol. III, part I, Land Revenue Manual (Revised Edition).

(*thariśu*), or on account of wet lands being cultivated with dry crops owing to insufficient supply of water (*Nanjanād punja*). In the case of *kaṛivu* and *thariśu* the full assessment and the water cess are payable. In the case of *Nanjanād punja* one-half of the paddy assessment on land will be recovered wholly in money at Rs. 4 per *Kōṭṭa* in addition to water cess; but if such crop fails the whole assessment and water cess will be remitted. This remission is a concession and not a right and the ryots seeking that relief have to apply for it. After inspection by the revenue authorities the matter will be decided.

Non-seasonal remissions apply to all kinds of lands. They are not subject to any general rules and are sanctioned by Government from time to time on special considerations.

Garden tax.—The system of fixing the garden tax was from earliest times to assess all occupied but unplanted land with a ground-rent called *paṭattupāṭṭom* in the northern taluks. This rent varied from one fanam (2 as. 3 ps.) to ten fanams (Re. 1-7 as.) per para in the northern taluks, while in the south it ranged from one to sixteen chuckrams per plough share, or the extent of lands capable of being turned up by a plough in a day. The usual practice was for the ground to be assessed with *payattupāṭṭom* when first brought under cultivation. But when it was planted and the trees began to bear, the trees were assessed and a tax imposed, the ground-rent being dropped. If, however, the trees planted were not bearing, they were not taxed and the ground-rent alone continued. In the five taluks of south Travancore, namely, *Thōvāḷa*, *Agasthiśwaram*, *Eraṇiel*, *Kalkulam* and *Viḷavancōde*, both tree and land taxes were levied at the same time, i.e., tax on bearing trees where they existed as well as on the land on which they stood.

Tree tax.—Besides the coconut which was the most extensively grown and the most valuable of all the trees, there were also the areca, the jack, the palmyra, the tamarind, the punna, the mango, and the iluppa, yielding revenue

to Government. Coconut was taxed throughout the State but in the earlier days the other trees were assessed only in certain parts of the State where they grew in abundance. Thus in the Quilon and Kōṭṭayam divisions only the areca and the jack were assessed. In the Trivandrum division, the palmyra was also included, while in the southern taluks all the 8 kinds of trees above named were brought under assessment. The rates of assessment for the different kinds of trees varied in different parts of the country. Thus in the taluk of Chirayinkūṭi, the areca and the jack had been lightly taxed at the rate of 8 cash and 4 chuckrams respectively per tree. In the southern taluks the jack was divided into five classes, and had 24 different rates of assessment. The tax on areca varied from taluk to taluk. However, under the Hookumnamah issued about 1012 M. E. (1836-'37) a uniform rate was fixed on all trees other than the coconut, the jack and the areca. The rates were, on an average, as follows:—

Palmyra	7 cash.
Punna	12½ „
Mango	12 „
Tamarind	3 chuckrams.
Huppa	1 „

For the coconut which was the chief garden cultivation no elaborate classification was made. Coconut trees were divided in the settlements of 978 M. E. (1802-'03) and 1012 M. E. (1836-'37) into four classes and assessed at 4, 3, 2½ and 2 chs. respectively per tree. These rates were introduced in north Travancore; in exceptional cases, however, the fourth class was also assessed at 1½ chuckrams. But in the taluks south of Quilon, the old state of things continued, the first class trees themselves being variously assessed at 8, 7, 6, 5, 4½, 3½, 3, and 2 chuckrams, while for the second class there were 3 rates of 4, 3½ and 3 chuckrams in Thōvāla, 3 and 3½ chuckrams in Eṛāṇiel, 3 chuckrams in the Agasthīśwaram and Kalkuḷam taluks, 3 and 2½ chuckrams in

Vilavancōde, Neyyāttinkaṛa, Trivandrum and Chirayinkil and 2 chuckrams in Neḍumangāḍ taluk. There were similar variations for the 3rd and 4th classes also. These rates were calculated at one-fourth the produce of such trees. The yield was calculated from the number of bunches of nuts and fronds. Thus trees with 8 to 12 bunches and 30 to 64 fronds were placed in the 1st class, 5 to 7 bunches of nuts with 24 to 29 fronds in the 2nd class, 3 to 5 bunches of nuts with 16 to 23 fronds in the 3rd class, and 2 to 3 bunches of nuts with 15 fronds in the 4th class.

This elaborate classification led to much abuse and confusion of accounts. There was the further difficulty under the system of periodical remissions for enhanced rent to know for certain how many trees in a garden had come into bearing during the preceding 12 years. In the case of garden lands under pāṭṭom tenure, there was a further complication caused by deductions on account of Naḍavukūr or the planter's share or compensation which was generally $\frac{1}{4}$ of the pāṭṭom or full assessment, but there were cases in which it was allowed at $\frac{1}{5}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{7}{10}$. Another feature of the old assessment of garden lands was that in the case of the coconut and the areca the tax took the form of a portion of the produce. They were taxed at so many coconuts or so many fronds or both and so many nuts respectively for each tree. This obtained in some taluks and there were rates of coconuts and fronds for each class of the coconut tree. For areca also, six distinctive rates of forty, thirty, twenty-five, twenty, fifteen and ten nuts for each tree were fixed.

Payment in kind presented many anomalies. In the taluks of Chengannūr, Vaikom, Ēttumānūr, Ālangāḍ, Paṭūr and Shērthala, tax was levied in the shape of so much oil per tree on those set apart in certain gardens for the sovereign's due or at rates varying from 7 chuckrams (4 as.) to 9 chuckrams (5 as.) when the Sirkar was not in need of oil. On failure to supply, the price at the current rate was

to be collected, and again there was inequality and unfairness in the commutation prices, varying from 5 fanams (12 as.) to 10 fanams (Rs. 1-7 as.) per 100 coconuts. A further and curious development of this system of payment in kind obtaining in the taluks of the Trivandrum and Padmanābhapuram divisions was that the tax fixed in money was payable, partly in money and partly in kind, the latter, however, consisting not of the produce of the tree taxed but of articles entirely foreign to it such as pepper, ghee, betel or plantain leaves and fruits.

The above anomalies which gave room for abuse called for correction. To secure uniformity throughout the State, it was resolved in the settlement of 1061 to have gardens throughout the State divided into blocks with reference to their situation, soil and productiveness and each garden charged with a distinctive rate carefully determined. This was not to exceed 4 chuckrams ($2\frac{1}{4}$ as.) or fall short of 1 chuckram ($\frac{1}{2}$ a.) for every coconut tree. The tax on the jack and the areca was made uniform throughout the State and palmyra, punna, tamarind and mango trees were declared liable to tax only in certain places. Tax on the iluppa was totally abolished as also the assessment in kind. The system of periodical revisions and Naḍavukūr were abolished, the present settlement being declared permanent for 30 years. The rates for garden lands classified under thirteen heads, those for the different classes of coconut trees and the uniform rates for the other kinds of trees are shown in the accompanying tabular statement.

Statement of Garden Assessment and rates for Trees.

Ground rent				For trees			
Paṭṭom per acre				Paṭṭom per coconut tree			
Class	Fs.	Chs.	Ca.	Class	Fs.	Chs.	Ca.
1	15	...	...	1	1	...	...
2	13	...	...	2	...	3	8
3	11	2	...	3	...	3	...
4	10	...	...	4	...	2	8
5	8	2	...	5	...	2	4
6	7	...	...	6	...	2	...
7	6	...	...	7	...	1	8
8	5	...	...	8	...	1	...
				Jack per tree			
9	4	...	...	1	...	...	...
				Areca and Palmyra			
10	3	...	...	8 cash 8 cash			
				Laurel or Punna			
11	2	...	...	12 cash			
				Mango			
12	1	2	...	12 cash			
				Tamarind			
13	1	...	...	2 chuckrams			

Besides the garden and paddy land assessment in vogue throughout the State there were special rates obtaining under special conditions of grants for cultivation. Under this head come the planters' estates which are taxed at low rates.

Lands granted for coffee or tea cultivation will bear an annual assessment of B. Re. one per acre. If any portion of *such* land is cultivated with cardamoms, rubber or other

special products liable to a higher tax, then such higher tax was levied with regard to the portion cultivated with such products. If the grass lands granted to proprietors of tea and coffee estates are planted with jungle wood of coffee or tea, a rate of Re. 1 per acre is levied.

Lands granted for rubber cultivation are assessed with a tax of as. 6 per acre for the first year and thereafter at a tax of Rs. 2 per acre. Sirkar thanathu, thariśu or pcrampōke lands found planted with rubber are assessed at Rs. 2 per acre from the date of occupation. If subsequent to the settlement any chēikkals are planted with rubber, the higher assessment laid down in the paṭṭa is imposed. The assessment for cardamom lands is Re. 1 per acre for the first four years of occupation with permission from Sirkar and thereafter at Rs. 2 per acre. If the land was occupied without permission the higher rate of Rs. 2 was levied from the very beginning. The assessment was subsequently increased to Rs. 3 per acre from 1110. In the case of the special grants in the Kaṇṇan Dēvan Hills the rates are half a British rupee per annum on every acre of land other than grass lands which is opened up for the purpose of cultivation and 2 as. 8 pies per annum on every acre of grass lands brought under cultivation or used for homesteads or for grazing cattle or other purposes. These rates are liable to alteration in the next settlement. Similarly, in the case of the Ten Square Miles Concession situated in the taluks of Shenkōṭṭa and Paṭhanāpuṛam, for lands which are planted with coffee, tea, etc., a tax of B. Re. 1 per acre is levied and for lands which have not been cleared and which remain as jungle a tax of as. 8 per acre is levied, while for lands brought under rubber cultivation a tax of Rs. 2 per acre is levied. Lands granted under the Land Colonisation Rules will be liable to ordinary assessment under the Puthuval Rules but will be exempt from paying assessment for the first four years. The rate for the fifth year will be one-fourth, in the sixth year one-half, in the

seventh year three-fourths and from the eighth year onwards the full assessment will be levied.

Extra Cess :—Besides the land revenue properly so-called, there were numerous petty extra taxes leviable on gardens as well as paddy lands. So many as about 100 of them were abolished in 1040 M. E. (1864-'65). There were still more than two hundred such taxes. Some of them were also personal in character, while others were attached to land. Many of these have since been abolished. In the last settlement all cases which were personal or related to profession as well as those falling on persons who paid the full assessment for their lands were abolished. They are however retained in a few cases where the tax is less than the full pāṭṭom and incorporated with the full demand.

Collection :—The taxes on paddy lands and gardens as well as the extra cesses above mentioned are collected by the Sirkar agency appointed for the administration of revenue. The tax in respect of wet lands is payable in two equal instalments for each crop except for the punja lands and except when the total tax due from a single paṭṭadār is Re. one and under. Tax in respect of garden lands is payable in four equal instalments except when it is Re one and under. The tax is payable at the following periods. (i) In respect of garden and wet lands, Vrischikam, Dhanu, Minam and Mēdam in Quilon and Kōṭṭayam divisions; Thulām, Vrischikam, Minam and Mēdam in Trivandrum and Dāvikoḷam divisions and Eḍavam for punja lands. (ii) Tax of one rupee and under is payable in one instalment in the month of Minam. (iii) The assessment on cardamom lands is payable in 2 instalments in the months of Vrischikam and Makaram each year; (iv) Assessment within the cardamom area on wet cultivation in Kumbham and on dry cultivation in Thulām every year; (v) Assessment for waste lands payable before 31st of Karkaḍakam each year; (vi) for Kaṇḍukrishī pāṭṭom punja lands, 10th of Mithunam; the last day for payment of the assessment under (i) to (iv) is the 15th of the month.

In the collection of each instalment, the amount of money or the quantity of paddy is required to be paid before the expiry of the month, failing which a demand notice is issued from the taluk calling upon the party to pay within a fixed time and stating that coercive process of recovery will be adopted on default. The procedure of collection, etc., is now regulated by Regulation I of 1068 M. E. (1892-93), under which any arrears of revenue can, after notice of demand, be levied by distraint and sale of movables belonging to the defaulters, failing which the tax is realised by the attachment and sale in whole or in part of the immovable property in respect of which the arrears are due. In case of default in paddy tax the *niṣak* or current market value of paddy and not the commutation rate of 6 chs. per para will be realised. According to the Regulation the land, the buildings on it and its products are regarded as security for the public revenue on such land, and such revenue is considered as the first charge on the land and shall take precedence of every other claim.

Śrī Paṇḍāraṇḍavaka lands :—The assessments on the Śrī Paṇḍāraṇḍavaka lands belonging to the Śrī Padmanābhaswāmy's temple at Trivandrum are fixed like other Sirkar lands and are collected likewise. But there is this difference that the whole tax for these lands has to be paid in kind except in Nānjanād where in connection with the last settlement the tax on Śrī Paṇḍāraṇḍavaka lands is ordered to be collected one-fourth in money and three-fourths in kind.

Śrīpādam lands :—The tax on lands in the Āttingal and Eḍakkōḍe *adhikāra*ms belonging to Śrīpādam are assessed likewise and the revenue collected in the same manner, the collection being made not by the Tahsildar of the taluk but by a special agency, the Śrīpādam Manager and his subordinates.

Kilimānūr and Eḍappally estates :—The arrears of rents due to the estates of Kilimānūr and Eḍappally, though not belonging to the State, are, in accordance with old practice,

ordered by Regulation IV of 1068 M. E. to be assessed as Sirkar lands and their revenue collected as arrears of public revenue. The village officers appointed by the head of the family collect the revenue demand in the ordinary course. When these fall in arrears, an application is made to the Tahsildars in whose jurisdiction such estates are situated for notice of demand. Further proceedings for the recovery of the arrears are taken under the orders of the Tahsildar as in the case of the arrears of public revenues.

Chērikkal lands :—The term 'chērikkal' is applied to certain tracts in the northern taluks which, owing to their high elevation, ravages of wild animals and difficulties of cultivation, were cultivated only at intervals, originally in a rotation of twelve years and latterly of six, four or three years. This was a system of fugitive cultivation resorted to by the ryots without any attempt to get the lands registered in their names. The Sirkar recognised this system and was content with levying a low rate of tax whenever such lands were cultivated. This was known as Malavāram or Vilamēlaḍi. The chērikkal lands were thus under the old practice immune from payment of assessment to the Sirkar during the years of non-cultivation, though the lands themselves once taken up by a ryot for cultivation need not be, and were not in many cases, relinquished by him. The tax on the lands, wherever levied, was moreover not a fixed quantity as in the case of other lands, but was assessed from time to time. It varied in proportion to the extent cultivated and with the produce raised thereon. These lands were neither generally entered in the Āyacut or other settlement accounts of the past, nor treated as registered holdings. There were Sirkar chērikkals of different tenures as well as chērikkals claimed by dēvaswoms and jenmis, on which less than the full paṇḍārappāṭṭom rates of assessment were levied.

The cultivation of chērikkals is of a peculiar character. The lands are cultivated for three, and rarely for four, successive years and then allowed to run into jungle.

The first crop raised is invariably paddy. The second crop is either paddy or other cereals or tapioca, and the third crop consists of cereals other than paddy, sugarcane, ginger, yams, plantains, etc. Cultivation is then stopped for some time. The period of fallow extended in early times to twelve years and in some cases even more. But with the extension of cultivation and the demand for land, the interval of fallow was gradually shortened so much so that in course of time only three years were allowed in some places. The usual rate of Sirkar tax levied on such lands was two-tenth.

There were various rules regarding the assessment of chērikkal lands, but in 1911 the Government prohibited the system of Mahavāfam and Vilamēlāḍi cultivation and cancelled the notifications relating thereto and the rules regarding the registry of chērikkals issued under date the 23rd March 1917, and directed that all government chērikkals or other Sirkar lands available for registry be thereafter dealt with under the ordinary Puthuval Rules, except those lands that were granted for the cultivation of coffee, tea, rubber, cardamom, etc., under special rules, in which case the special rules would continue to apply.

*Conservancy of lands and prohibitory assessment:—*To check unauthorised occupation of government land, the Land Conservancy Regulation was enacted. The regulation now in force is Regulation IV of 1091. Sec. 3 defines the term "property of the Government," and the occupation of such land without permission of the Government, for however short a time, is declared unlawful. Unauthorised felling of trees or digging and carrying away earth from the property of the Government or holding over after the expiry of the prescribed term or violating the conditions of a lease, etc., come under the description of unauthorised occupation. It is the duty of the officers of the Land Revenue Department to check the unauthorised occupation of any 'property of the Government'. When there is such occupation, the Regulation

provides an enquiry to be conducted by the Tahsildar. The Tahsildar should decide the matter after giving notice to the party concerned and hearing his objections and evidence. If he finds that the party is not guilty of unauthorised occupation, he should exculpate him and strike the case off the file. On the other hand, if he finds the party guilty, he should enter a conviction against him and pass such orders as he deems proper under sections 6 to 9 of the Regulation. He may impose all or any of the penalties prescribed. The penalties are:—(i) fine up to Rs. 200, (ii) assessment, ordinary or prohibitory, with arrears for the period of occupation, not exceeding 10 years, (iii) damages, if any, (iv) forfeiture of any crop raised; and (v) eviction.

The levy of the assessment depends upon the nature of the land under occupation. If the land is porampōke, prohibitory assessment should be imposed. In other cases ordinary assessment on the areas under occupation leviable under the Puthuval Rules will be sufficient. Prohibitory assessment is a multiple of the ordinary assessment on the land excluding the area allotted for taxable trees together with the tax on such trees. In all cases of unauthorised occupation of lands which are the property of the Government prohibitory assessment will be invariably imposed on the party. The payment of such assessment does not confer any right to such land and the liability to pay such future assessment will cease only on the land being relinquished voluntarily or on eviction by Government. Eviction from such lands is compulsory. Appeals are provided for from the decision of the Tahsildar to the Peishkar. Any action under this Regulation does not exempt the party from being proceeded against under any other law for the time being in force. Remedy by civil suit is provided to the aggrieved party if his contention is that the land is not the property of the Government.

Disposal of government land:—The disposal of government land is now governed by the provisions of the Land

Assignment Regulation III of 1097. The Regulation defines what 'government land' means and states that government lands used or reserved for public purposes or for communal use of the villagers or whose registry is prohibited on considerations of public policy cannot be disposed of. The assignment of lands may be by public auction or without auction, subject to the payment of the assessment fixed therefor.

Various rules like the Puthuval Rules, Colonisation Rules, Kuthakappattom Rules, Rules for assignment of lands for rubber, cardamoms, etc. are framed for the disposal of different kinds of lands. The officers authorised to sanction assignments are the Tahsildar, the Assistant Peishkars, the Division Peishkars, the Land Revenue Commissioner and the Government. The Government is the final authority on the matter.

BIBLIOGRAPHY.

- Baden Powel.
 Kēśava Pillai, K. N.
 Kunjurāman Nāyar: T.
 Krishna Rao,
 Logan.
 Nāgam Aiya, V.
 Padmanābha Aiyar, S.
 Rāman Mēnon, M.
 Rāman Thampy, P.
 Sankarān Pandāla, K.
 Sundaia Aiyar, P. R.
 Sundaiafāja Aiyangar.
 East India Company's Fifth
 Report.
 Land Revenue Manual Vols. I
 to V (1st Edition) with sup-
 plement.
 Land Revenue Manual (Revised
 Edition) Vols. I to III.
 Land Tenures of India.
 Reports on Kudumba Poruthy
 lands.
 Memo on Land Tenures.
 Report on jenmi and Tenant's
 problems.
 Revenue Handbook.
 Malabar Manual.
 Travancore State Manual. Vol.
 III (1906)
 Settlement Final Report.
 Land Tenures of Travancore.
 Report on Jenmi and Kudiyāns.
 Commentaries on Jenmi and
 Kudiyān Act.
 Malabar Land Tenures.
 Land Tenures of Madras Presi-
 dency.

CHAPTER XVI

FORESTS.

Travancore is favoured by nature with wide differences of elevation, temperature and rainfall, which contribute to the natural regeneration of plant life. Nearly one-third of the total area of the State consists of reserved forests which form a permanent source of natural wealth. There is a very large variety of trees, shrubs, vines and roots of economic value and a diversity of animals, which are not only of interest to the sportsman but provide new openings for the scientist and the manufacturer. Judged by the geological formation of the soil and the existing old trees and the decayed timbers sometimes dug up in the low country, it may well be presumed that the forests must have been more extensive than they are now. The growth of population and the resulting demand for more land for cultivation were responsible for reducing the forest to its present area. There is now a distinct line dividing the forest tract from the occupied portion of the State.

The total area of the State Forests (reserved forests and reserved lands) has remained more or less constant with slight variation during the past 25 years. In certain cases, however, cultivable and cultivated lands have been acquired and added on to the forests for purposes of conservancy. But such cases have been very rare. When Mr. Bourdillon wrote his report in 1067/1892, the total area of the tract covered by forest was about 3,544 square miles, but at the end of 1111, the total area of the reserved forests stood at 2,401 square miles and 573 acres and that of the reserved lands at 84 square miles and 474 acres, making a total of

2,486 square miles and 407 acres. In addition to this there are fuel and fodder reserves to the extent of 1,754 acres.

The necessity for a consolidated scheme of Forest Conservancy was realised by the Government ever since the time of Dewan Sir T. Mādhava Rao. With this object in view the Government passed a series of orders prohibiting the clearing, felling or burning of forests between the years 1033-1063. With the passing of the Forest Regulation in 1063 began a steady programme of constituting reserves. The first reserve was proclaimed in the year 1064, when a large block of 300 square miles near Kōnni was declared a reserved forest. Another reserved forest in the neighbourhood of Kulthūppula and Ārienkāvu, with an area of 121 square miles, and a third comprising 116 acres in Vēḷi were proclaimed in 1067. A fourth reserved forest of 344 square miles in Malayāttūr and a fifth one 5 square miles in extent at Mūkkunnimala near Trivandrum were included in the Reserve in the same year. This policy was pursued in subsequent years. The reserved areas are classified under two main heads, timber reserves and fuel and fodder reserves. The reserved forests now constitute 31·5 per cent of the total area of the State. The whole of this area is not wooded and even the wooded areas do not all contain merchantable forests. Considerable portions of it are rocky or covered with grass without any tree-growth. A fair proportion of land in the reserved forests consists of high ridges and steep slopes.

There is an impression gaining ground that the Forest Department is going on adding more areas to the extent of their reserved forests and that sufficient encouragement is not extended by the department for converting swamps and other suitable lands within the reserved forests for paddy and other cultivations. This is not correct. The sub-joined statement will show that the reserved forests and reserved lands which stood at 2,489 square miles and 14 acres in 1086 have only decreased to 2,486 square miles and 407 acres at

the end of 1111, i. e., during a long period of nearly twenty five years.

The total area of reserved forests, reserved lands, and fuel and fodder reserves.

Year.	Reserved forests		Reserved lands		Fuel and fodder reserve	
	Sq. miles	A cres	Sq. miles	A cres	Sq. miles	A cres
1086	2,330	177	155	477	...	...
1087	2,334	623	147	356	...	...
1088	2,337	534	145	130	...	...
1089	2,337	209	144	468	...	...
1090	2,344	181	124	241	...	...
1091	2,346	220	136	155	...	...
1092	2,344	170	135	525	...	...
1093	2,383	117	77	50	...	...
1094	2,381	320	76	624	...	...
1095	2,386	422	71	145	...	...
1096	2,387	495	68	525	11	28
1097	2,387	578	66	392	...	...
1098	2,381	164	63	92	...	...
1099	2,382	95	65	405	...	...
1100	2,390	157	66	63	...	...
1101	2,392	44	93	381	4	533
1102	2,391	480	93	553	4	129
1103	2,395	298	94	138	3	195
1104	2,394	171	93	119	3	495
1105	2,393	254	93	105	3	495
1106	2,393	211	93	199	3	495
1107	2,396	371	89	436	3	495
1108	2,397	39	88	538	3	97
1109	2,396	24	88	538	6	464
1110	2,396	617	88	191	6	216
1111	2,401	573	84	474	2	474

As a result of repeated complaints on the floor of the Śrī Mulam Assembly that the Forest Department has not been affording facilities for the cultivation of suitable lands within the reserved forests, taluk committees were appointed to inspect all the available swamps in all the existing reserved forests and to recommend their suitability for paddy cultivation. In response to the reports of such taluk committees certain lands were disafforested and thrown out for cultivation.

The value and utility of forests in an agricultural country like Travancore cannot be over-estimated. Professor Schillies summarises the uses of forests as follows:—

1. Forests supply timber, fuel and other forest produce.

2. They offer a convenient opportunity for the investment of capital and other enterprise.

3. They produce a demand for labour in their management and working as well as in a variety of industries which depend upon forests for their raw materials.

4. They reduce the temperature of the air and soil to a moderate extent and render the climate more equable.

5. They increase the relative humidity of the air and reduce evaporation to a considerable extent.

6. They tend to increase rainfall.

7. They help to regulate water supply, ensure more sustained feeding of springs, tend to reduce violent floods and render the flow of water in rivers more continuous.

8. They assist in preventing land-slips, avalanches and silting of rivers and low lands and arrest moving sands.

9. They arrest the velocity of air current, protect adjoining lands against cold and dry winds and afford shelter to the cattle, game and useful birds.

10. They assist in the production of oxygen and ozone.

11. They may under certain conditions enforce the health of the country and under others endanger it.

12. They increase the artistic beauty of a country.

After all, the percentage of the forest areas to the total area of the State (31·5 per cent.) is only normal. Burma has 59·5 per cent. of her total area as forests, Assam 32·9 per cent. and the Andamans 70·2 per cent. All the same a policy of judicious disafforestation of as much suitable land as practicable for paddy cultivation is being systematically pursued.

Owing to variations in climate, altitude and rainfall the forests of Travancore present a variety of characteristics. The following is Bourdillon's classification :—

Classification.

- I. Heavy moist forests of evergreen trees.
- II. Land originally covered with moist forests, but now overspread with shrub of various ages, the resulting growth after being abandoned by hill cultivators.
- III. Deciduous forests with grass growing under the trees.
- IV. Rocky land covered with short grass and useless for any purpose except pasture.

The heavy moist forest is believed to have at one time extended all over the low country in North Travancore.

It is now confined to the slopes of the hills. The trees comprising it grow very close together and present many different species. Forest fires do little harm here, as the trees are evergreen and there is no undergrowth of grass. In spite of the large variety of trees in the area these forests are much less valuable than the deciduous forests (under class III) as the greater part of the timber available in these regions remains unknown. Nevertheless, some of the trees command good prices. With the rapid industrialisation of the country and the impetus now given to the manufacture of ply wood, packing cases, etc., timbers which have been hitherto considered unmarketable are bound to command a

good price in the market. The following are some of the most important species of timber trees found in the ever-green forests:—

- | | |
|------------------|---|
| 1. Ebony. | 23. Mango. |
| 2. Karubagam. | 24. Red Wood. |
| 3. Ānjili. | 25. Thenchera. |
| 4. Jack. | 26. Anpalam. |
| 5. White Cedar. | 27. Shurati. |
| 6. Red Cedar. | 28. Malampuliy. |
| 7. Punna. | 29. Kurangadi. |
| 8. Nangu. | 30. Muṭṭukongu. |
| 9. Gamboge. | 31. Ūnaval. |
| 10. Pūthankolli. | 32. Maṇimaruthu. |
| 11. Cotton. | 33. Kaḍampa. |
| 12. Chīni. | 34. Pāla-Crysophyllum
raxburghianum. |
| 13. Enṇa. | 35. Do. Dichopsiselliptica |
| 14. Payin. | 36. Kaṛinthuvara. |
| 15. Veḍipilāvu. | 37. Ēlilappāla. |
| 16. Pola. | 38. Nutmeg. |
| 17. Malauram. | 39. Cinnamon. |
| 18. Olankara. | 40. Kola mava. |
| 19. Peru. | 41. Thonḍi. |
| 20. Dammer. | 42. Aval. |
| 21. Venkoṭṭen. | 43. Arānfili. |
| 22. Kaḍapilāvu. | 44. Fib. |

The second class of forests contains no valuable timbers, as the bushes and scrubs springing up after clearing and burning are of useless kinds of trees. All these, however, are short-lived and give place to better forests after growing for some ten years. In this class are included all forests cleared for the cultivation of tea, coffee, ragi, etc.

The third class of forests are on the foot of the hills and are largely met with in South Travancore. These grass

forests are also found covering the ridges and higher grounds where the soil is too dry for the growth of evergreen forests. A small part of the hill plateau is also covered with forest of this description.

The deciduous forests contain a much smaller number of species than the moist forests, though their value and utility are greater. They suffer much annually from grass fires which become more intense when the trees are felled, since the branches and top ends left about feed the flame. The most important varieties of trees found in these forests are :—

- | | |
|-------------------|---------------------|
| 1. Teak. | 14. Ney Thēkku. |
| 2. Blackwood. | 15. Nux Vomica. |
| 3. Sandalwood. | 16. Gallnut. |
| 4. Irūḷ. | 17. Uthi. |
| 5. Vēnga. | 18. Kumpiḷ. |
| 6. Thēmpāvu. | 19. Pēra. |
| 7. Veṇ Teak. | 20. Nelli. |
| 8. Melli. | 21. Vāka. |
| 9. Pūvan. | 22. Mura. |
| 10. Vekkali. | 23. Chinna Kaḍampa. |
| 11. Muller Vēnga. | 24. Mala Uthi. |
| 12. Veṇ Maṛuthu. | 25. Muṛukku. |
| 13. Thānni. | |

The fourth class of forests is worthless so far as timber production is concerned, but is useful as affording grazing grounds and for the collection of manure leaves.

The forest flora of Travancore is unique and presents wide diversity both in species and number. This peculiarity is due to abundant rainfall, wide variations in elevations and temperature, regular seasons and, above all, the salubrious climate of the State. This accounts for the marvellous number of species of trees,

Forest flora.

shrubs, climbers and creepers, parasites and epiphytes so abundantly found. So far 592 varieties of timber trees and 3,538 flowering plants, shrubs, etc., have been identified. But there are a great many more which have yet to be identified. The most valuable timber trees of Travancore are the following :

- | | |
|--------------------|-------------------|
| 1. Teak. | 16. Pāvan. |
| 2. Blackwood. | 17. Maruthu. |
| 3. Ebony | 18. Mango. |
| 4. Sandalwood. | 19. Punna. |
| 5. Ānjili. | 20. Chīni. |
| 6. Thampagam. | 21. Pāthiri. |
| 7. Vēngai. | 22. Elavu. |
| 8. Thēmpāvu. | 23. Kaṛinthakara, |
| 9. White Cedar. | 24. Shenkurandī. |
| 10. Red Cedar. | 25. Vāka species. |
| 11. Veṇteak. | 26. Venkoṭṭen. |
| 12. Jack. | 27. Kaṛinjāli. |
| 13. Irul. | 28. Kolavu. |
| 14. Myla. | 29. Ñāval. |
| 15. Manja Kaḍampu. | |

When Mr. Bourdillon wrote his report, only the first 23 species were considered valuable. Since then other species of timber as Shenkurandī, Vākai, Venkoṭṭen, etc., have been extracted and put into the market. These fetch good prices. In fact there are now more than 100 species of timber trees for which seigniorage and tariff values are fixed by the Forest Department. All of them are put to some use or other. The people will certainly come to know the uses of other trees hitherto considered useless, especially when valuable trees become scarce and difficult to obtain. Many species of trees, though they may not yield good timber, yield very valuable gums and resins. Some yield useful fibres and fruits, while others possess medicinal properties.

The importance of a regular supply of wood to a country cannot be over-estimated. Wood is used as timber for structural purposes, agricultural implements, tools, furniture and as fuel for domestic and industrial uses. Though in modern times iron and concrete have to a great extent begun to replace timber, it still holds its position as an indispensable item of necessity to mankind and is likely to remain so for ever. In like manner coal, lignite and other substitutes have been replacing firewood in some countries. At the same time new demands for the use of wood are cropping up every day, as preparation of wood pulp for the manufacture of paper, artificial silk and plywood manufacture. A good portion of firewood is converted into charcoal large quantities of which are used for domestic fires, iron smelting and other allied industries. In a poor country like Travancore the majority of the people cannot afford to go in for wood substitutes and will have to depend upon wood alone for their requirements and, as such, wood is as valuable and necessary to us as the air we breathe or the water we drink. This would stress the necessity for the preservation of our forests.

The claims of sylviculture are receiving increasing attention from the Government. Sylviculture means "the culture of forest, i. e., all operations or measures connected with the formation and preservation and treatment of forest". Steady endeavours are being made

1. to bring about and assist the natural reproduction of important species,
2. to adopt a system of artificial reproduction when necessary to supplement natural reproduction,
3. to attend to the coppices growth of fuel trees,
4. to increase the number of regular plantations, and
5. lastly, to attend to hoeing, thinning, clearing and mending operations.

During the past many decades the Government has been devoting great attention to open teak plantation in several places. The plantations date back

Teak plantations. to the time of Dewan Rājā Sir T. Mādhava Rao. In his letter to the Resident, Mr. Fisher, No. 73 dated 9th Jan. 1864, he had emphasised the necessity of replenishing the depleted forests by planting teak. The first planting was commenced in 1040 M. E. (1865) near Malayāttūr. The attempt was a failure. Nevertheless, further attempts were made and regular plantations were opened at Malayāttūr and Kōnni in the year 1042. Between the years 1042 and 1049, 392 acres (200 at Kōnni and 192 at Malayāttūr) were planted with teak. From 1050 to 1067, there was no planting at Malayāttūr, as the Malayāttūr plantations proved to be more expensive and the place was infested with malarial fever. Planting was, however, continued at Kōnni. In 1065 a beginning was made to start plantations at Ārienkāvu. An area of 150 acres was cleared and planted with teak. This proved to be a failure on account of the dry season and want of adequate attention. But in 1067 another plot of 36 acres was successfully planted up with teak.

During the period from 1042 to 1067 planting was spasmodic and intermittent but subsequently it has been more regular and systematic. In 1083 there were over 2,540 acres distributed as follows:—

Malayāttūr.	751.42	acres.
Kōnni.	1,452.71	, ,
Ārienkāvu.	336.38	, ,
Total.	<u>2,540.51</u>	, ,

Since then there has been uninterrupted planting. Kōnni and Ārienkāvu continued to be planted, while Mallana by the side of the Mallana Thōḍu and Eḍaman in the Quilon division were newly added. Thus at the end of 1094 the

total area of the teak plantations in the State was about 4,083 acres.

Towards the close of 1094, the Conservator of Forests adumbrated a scheme by which it was proposed to plant up

one square mile (640 acres) of land with
Extension. teak every year. In pursuance of that scheme the required sites for planting for ten years in all the divisions were selected and the necessary sketches prepared. But the scheme did not work well as the sites selected in some of the divisions were found unsuitable for the growth of teak. However, the progress of the teak plantations in the State ever afterwards has been steady and rapid, and the method of raising the plantations underwent considerable change. In 1096, the department conceived the idea of opening teak plantations under the taungya system. This system was tried in several places, in a few of which it proved to be a failure. The reasons for the failure were:—

1. Unsuitability of the soil.
2. Difficulty of getting reliable contractors.
3. Difficulty of procuring labourers.
4. Adverse weather conditions and scantiness of rainfall.

It must, however, be admitted that the taungya system has on the whole been successful. Under it not only were all works, such as clearing and burning, lining and planting, weeding, supplying failures, etc., up to the time when the plants were 18 months old, carried out by the taungya cultivators at their own cost, but a premium also was paid by them to the Government, the amount varying from Rs. 1½ to 4½ per acre, according to the convenience and suitability of the land for paddy cultivation.

The policy of systematic planting of teak was followed for over half a century in the State, as a result of which we had at the end of 1111 teak plantations to the extent of

13,663 acres. Mr. H. Tireman, I. F. S., Chief Conservator of Forests, who happened to visit the State Plantations in 1101 expressed very high appreciation of the system of planting and the conditions of the plantations and stated that the teak plantations here were better than those of Nilamthur which are considered to be one of the best in India. While the area planted with teak during the 58 years from 1042 to 1100 was only 8,060 acres, the area planted with it during the ten years from 1101 to 1111 was as much as 5,603 acres.

“The natural habitat of sandal is stated to be at an elevation of 2,000 to 3,500 ft. though it ascends to over 4,000 ft. and descends up to 1,200 ft.” It flourishes when planted even at sea level, but naturally it is a tree of the upland plateau, growing chiefly on undulating ground, and often on hill sides and in open spaces along the banks of rivers and in ravines. The important sandal tracts lie in regions where the rainfall varies from 25 to 65 inches, but the tree is occasionally found where the rainfall is above or below these limits. It is often cultivated in tracts where the rainfall is as much as 100 inches. The most favourable soil on which the tree grows is a red ferruginous loam varying in fertility, the underlying rock often being metamorphic, chiefly Gneiss. It is often found on rocky ground or on stony or gravelly soil. The trees growing on poorer ground, particularly on stony or gravelly soil, possess highly scented wood, though they do not attain to any large dimensions. But it has not been proved that the rule is of general application. The tree requires good drainage and does not thrive on water-logged ground.*

Sandal does not generally occur in high dense forests. It is found in open scrub jungle, hedges, and among lantana bushes. Owing to its economic and commercial value, its restricted occurrence confined to certain portions of the

* Troups, Indian Trees.

Indian Peninsula, and its absence in other parts of the world, it is declared a royal tree belonging to the State, even when it grows on private lands.

Sandalwood plantations have not proved quite successful in Travancore. The first attempt was made in 1858 when about fifty acres of land near Quilon were planted. It was not successful. The climatic conditions in Travancore do not generally appear to be congenial to the growth of sandal or the production of scented wood. The Forest Department attempted to extend the natural sandalwood forest by planting ten acres of land every year close to the Ārienkāvu sandalwood regions. That attempt also proved abortive. But in places where sandalwood grows spontaneously the wood possesses a fine scent. The only place in Travancore where sandal grows profusely and yields scented wood is Marayār in the Anchanād valley where we have sandalwood reserves of natural growth. Experiments in sandalwood plantations received an impetus when Mr. Rāma Rao became the Conservator of Forests. He made an earnest attempt to introduce sandal in all the Forest Divisions, and sandal seeds were got down and distributed to all Forest Ranges for broadcast sowing. In 1094 a scheme was sanctioned by the Government by which the hillmen residing in Marayār were permitted to cultivate Sirkar lands on a rotation of three years, subject to the condition that they should sow sandal seeds in the cleared areas at the end of the second year and surrender the land to the Forest Department thereafter. The same concession was extended to the fire watchers and other lower subordinates of the Forest Department. But the experiments did not prove quite successful.

Plantations of rubber, casuarina, elavu and cashew-nuts have also been opened. A few mahogany plants and baedy plants are also grown in stray plantations.

Forest exploitation is regulated by working plans or working schemes so as to bring all important forests under

systematic management to ensure continuity of treatment and orderly and economic working as well

Working Plans. as forest regeneration. A working plan is a statement drawn up for a certain area of forest land laying down and prescribing the whole of the operations which are to be carried out within the area for a definite number of years. "In other words, it is a Forest Regulation prescribing the application of certain cultural rules, execution of certain works in order to produce a given desired result. In a forest worked on economic principles, the desideratum is generally to obtain perpetually a regular supply of produce in the greatest quantity, that is, a maximum sustained yield. A working plan indicates how this is to be done".

A simple form of forest working plan was first conceived by Mr. Munro who was the Conservator of Forests in Travancore during the twenties and thirties of the 19th century. It was the result of his special study regarding the rate of growth of teak in Travancore forests. But the idea of forming a regular plan did not materialise. Fifty years afterwards Mr. Bourdillon took up the idea of introducing some systematic working plan. Towards the close of 1875 working schemes on a rotation of six years were drawn up for thirteen reserves, aggregating to about 1,189 square miles. These schemes only served to localise fellings in a compact area. They did not visualise a regulated system or take into account the demands of scientific silviculture. They did not work satisfactorily as the coupes opened in a six years' rotation were found to be too large to be gone through in a single year.

The first regular working plan on a scientific basis, embracing an accepted silvicultural system, was drawn up in the year 1883 for the forest of the Shendurney valley. In the same year another working plan for the treatment of the teak plantations of the State was also prepared. In 1885 preliminary steps were taken to prepare a plan for

working the sandal trees in the Anchanād Range. In less than eight years many of the valuable and important Reserves of the State were brought under the provisions of sanctioned working plans. At the end of 1093, the area brought under the sanctioned working plans came up to 377 square miles and 210 acres.

In the Forest Conference held in 1093 it was resolved that the preparation of further working plans on an elaborate scale was not necessary in view of the incomplete and unreliable data available at that time and that the preparation of simple working schemes was sufficient. The Government accepted the principle laid down by the Conference. In pursuance of the above government order the department made much headway in the preparation of simple working schemes for all the important and valuable forests of the State. 1,014 square miles were brought within the benefit of this regulated plan of work by the end of 1111. The work is in progress and the directions regarding rotations are adhered to as far as possible.

Forest produce is classified as major and minor. Wood including timber and fuel falls under major produce. All the rest of the products that can be had from the forests are termed "minor produce".

Exploitation of forest produce. Timber is the important major product and for purposes of accounts it is again subdivided into (a) royalties, (b) junglewood, (c) plantation royalties, and (d) plantation junglewood. The general utility of timber and the importance of its regular supply to a country like Travancore has already been noticed.

The problem of fuel supply in Travancore is one of great importance. With the rapid increase in population and the intensive cultivation of land which has followed in its wake, every available space of forest land is being cleared and brought under cultivation after cutting down the forest growth. Vast areas of private forests have been cleared

for rubber and tea plantations. The quantity of fuel obtainable from private lands is thus decreasing steadily. A large proportion of the fuel yielding trees in the area to the west of the Forest Zone, including such fruit-bearing trees as mango, cashew, etc. have been already felled and utilised. No attempt is made to replant private lands with timber trees. The demand for fuel is therefore becoming greater every day and the price is growing high. At the present rate of depletion there is the possibility of a fuel famine in Travancore in two or three decades. To minimise this danger the Forest Department is reserving a number of minor forests.

The extraction, transport and disposal of timber are discharged both by government agency and by private consumers and purchasers. They are regulated by demand and by the requirements of silvicultural principles. The systems of fellings now obtaining in Travancore are:—

1. Selection fellings in the coupes of several working circles.
2. Clear fellings in the areas selected for raising teak plantation.
3. Improvement fellings.
4. Coppice fellings.
5. Unregulated felling from unreserved lands and registered holdings.

Extraction of timber is also done under “mēl-lābhom” system. Contractors are engaged by the Forest Department to work down timbers from specified areas to the sale depots or selected places of disposal, where they are generally sold in public auction.

Teak, blackwood, ebony and sandalwood, whether grown or found on government land or private property, are royalties. So are elephant teeth and ivory.

“Royalties.”

Royal trees cannot be felled by any person without the written permission of the Conservator of Forests or an officer authorised by him in writing, even when they stand on private lands. It is an offence under the Forest

Regulation to fell, girdle, mark, mutilate or otherwise damage any tree which is a royalty, and to be found in possession of such trees or any forest produce which is a royalty without having honestly obtained it.

At the 19th session of the Śrī Mūlam Popular Assembly, representations were made by certain members regarding the rights over the royal trees standing on private lands. They complained about the delay and hardship incidental to the settlement of kuḍivila claims and urged that as the procedure then followed deprived the owners of private lands of the full benefit of the royal trees standing on them, the holders of such lands should, as in British India, be allowed full rights over the royalties growing thereon. The members also desired that the matter should be referred to the Committee which was then sitting to discuss the free pass rules. The Government accordingly ordered that the question of giving full rights on royal trees to the owners of private holdings be referred to the Committee, which was requested to examine and discuss the question on all its bearings. In pursuance of the above government order, the Committee inspected various localities and, after an elaborate discussion of the matter in all its aspects, submitted their report on the 5th August 1927.

The members of the Committee were of the opinion that both the Government and the people would be benefited if the abolition of the monopoly on royalties was given effect to within ten years, in which time the Forest Department should put forth its best endeavours to remove all royalties standing on private lands and leave the people whatever was left behind free from all restrictions. They suggested that for this purpose the State might be divided into three tracts as shown below :—

(1) West of the Main Central Road and West of the Main Southern Road.

(2) West of the road passing from Nāgercoil to Thuckalai, Māykoḍe, Kulāśekharam, Kaḷiel, Neḍumangād,

Pālōḍe, Thenmala, Punalūr, Paṭhanāpuṛam, Kōnni, Rānni, Maṇimala, Kānjirappally, Īrāttupēṭṭa, Pālai, Thoḍupūla, Maṇvāttupūla, Kōthamangalam, Thaṭṭakkād and Peṛiyār.

(3). All land east of tract No. (2).

It was also recommended that with a view to expedite matters and save private owners from considerable delay and loss in the matter of getting the kuḍivila amount, the kuḍivila rates for the different classes of royalties were to be fixed. The Committee proposed the following rates of fixed kuḍivila to be paid to the owners immediately on delivery of timbers at the Depot :—

	Blackwood I Class.	8 annas	per c. ft.
	II Class.	4 annas	„ „
	III Class.	2 annas	„ „
Teak.	I Class.	6 annas	„ „
	II Class.	4 annas	„ „
	III Class.	2 annas	„ „

The proposal of the Committee was accepted by the Government and the scheme was given effect to from the 14th Eḍavam 1107. As the two years allowed for the abolition of royalties on tract No. (1) expired by the end of 1108, a royal proclamation was published in 1111 by His Highness the Mahārāja abolishing with effect from the 1st Chingam 1109 the government monopoly on royal trees growing on tract No. (1), i. e., on lands situated west of the Main Central Road and the Main Southern Road.

The transport of timber has had a chequered history. The permit system was followed by the depot system and both were finally abandoned in favour of the contract system which now prevails. The measures adopted from time to time were not only tentative but were lacking in a perception of method suited to local conditions. The policy frequently varied with the ideas of the officers who managed the Forest Department from time to time. Royalties were felled almost entirely by

government agency up to the year 1054. Till that date only first class teak which was above 12 *vaṇṇams* was felled. In 1054 contracts were made with private persons to deliver teak above 10 *vaṇṇams* in order to fulfil the agreement made by the Government with Messrs. Walli Bhayi Kaderbhay & Co. of Bombay that they would supply a fixed quantity of timber to the firm every year. There were only a very few contractors at the time and that facilitated supervision. The Aminādārs were directed to accompany the contractors' men to the forest and to mark out the trees to be felled by them. But in course of time the number of contractors increased and effective supervision became impossible. In 1057 contracts were entered into with private individuals to fell and deliver Kōl Teak. As the timber felled in this manner was found to yield a handsome revenue, advertisements were published calling for more contractors. This attracted a crowd many of whom were inexperienced persons with doubtful solvency. The practice was to make advances to the contractors to cover a portion of the expense of bringing the felled logs to the depots. This gave rise to several abuses and the Government thought that the system was responsible for the defects in its working. They therefore introduced the depot system in 1060.

According to this new system all felled timber of whatever kind had to be brought to the depots for sale. This was disadvantageous in several ways. The contractors who agreed to deliver timber at the depot engaged many sub-contractors who did almost as much mischief as the old permit holders. They brought to the depots only timber from areas conveniently situated and easily accessible. The depot system was as bad as the previous one with the difference that the right to fell was given only to a limited number of persons. It was therefore abolished in 1063 and the old seigniorage system was reintroduced with much higher rates, the charge being levied per candy of timber felled. This system again got into abuse as many of the sub-contractors

received large advances from the contractors, which they could never hope to pay off either in work or in money. Besides, it was usual with the contractors to give out sub-contracts to men on the understanding that timber was to be felled and delivered at the depots. They often failed to fulfil their obligations to their sub-contractors and the latter had not enough money to keep up to the terms of their contracts. It often happened that logs were left in the forest to rot as the sub-contractor had not the necessary money to work the timber to the depot. The number of contractors employed during this period was too large and only a very small staff of the Forest Department was available to exercise any check on them. Considerable waste was occasioned by the felling of timber. The seigniorage system was thus found to be a failure again and the permit system was therefore reintroduced.

Permits were issued by the Forest Department enabling the holders thereof to fell all kinds of timber. They specified the place from where timber was to be felled, how it was to be brought down and what length of time was allowed for its removal. They were issued on payment of the ordinary fees. If the permit holder wished to fell in a reserve, he was also supplied with a pass to enable him to enter the forests. The permit obtained, the holder of it could get his timber ready and then bring it to the side of the road or the river whence he could transport it to its destination after getting it stamped by the Aminādār who measured the logs and entered the measurements on the back of the permit. The timber was then removed through the route specified in the permit. It was stopped at each watch station on the way and examined. This system was perhaps more convenient to the people than the depot system, but it required careful supervision. It was abolished in 1077 M. E. and it was ordered that the useful kind of timber in demand should be sold at the depots and that any particular kind of timber not available there would be

supplied if previous intimation was given to the Divisional Forest Officers concerned. If it was not possible to supply it, permits were given to fell the same in limited quantities from the government forests.

Owing to the reckless operations of the contractors and permit holders in previous years, large quantities of abandoned rovat and junglewood timber were found lying in the forest in 1084. The systematic removal of such timbers and their transport to the sale depots were undertaken through departmental agency. The system having been found ineffective, the Government desired to devise a better method of extracting timber. The contract system which is now in vogue was then adopted.

The problem of timber transport is not difficult as there are eighteen rivers and their tributaries flowing throughout the forest regions. Moreover, the State has an elaborate road system connecting the banks of rivers with the collecting places and markets. It is easy to cut down timbers and float them down the rivers. Transport of timber from the forest to the country is generally done by rafts, tying the timbers together and floating them. In the case of heavy timbers which may not float, bamboos are often attached to the rafts to enable them to float easily. Elephants play a prominent part in timber transportation. They drag down the timber from the stumps of trees to places accessible by water or by road. Except as regards fuel and other minor forest products, human agency is seldom availed of.

The term "Disposal" includes collection as well as sale. Collection is made at the depots near the market places. A large quantity of timber is exported every year to British India which is the chief market. A statement showing the quantity and value of timber extracted and sold during the last 30 years (1082-1111 M. E.) is appended to this chapter.

Elephant capturing is another important item of work of the Forest Department. Elephants are met with in large numbers in certain parts of the forests.

Elephants.

They have a habit of wandering in herds. Their movements depend upon the weather conditions and the availability of food in particular areas. The descend from hill tops as the water supply begins to fail there, i. e., about January and thereafter. Advantage is taken of this annual descent from the hills in the hot weather to capture these animals in pits. They roam about in the lower valleys, in dense thick forests by the sides of rivers. As soon as showers begin to fall in April or May, they instinctively know that they could get water and fresh fodder on the top and they therefore commence the movement upwards of hills.

In places where elephant capturing operations are proposed pits are dug at spots through which the elephants are known to pass in the course of their peregrinations. The pits are generally circular in shape, 12 ft. diameter at the top and 9 ft. at the bottom and 10 ft. deep. The sloping sides are intended to break the fall. Brushwood and bundles of grass or leaves are laid at the bottom of the pits to a depth of three to four feet as a further precaution against injury to an animal falling in, and care is taken to renew the bedding from time to time as it is liable to sink or harden after some days. The earth excavated is removed to a distance and spread out or covered by dead leaves or twigs. The mouth of the pit is closed by split bamboos or sticks laid crosswise and covered with a layer of grass or leaves so as to conceal their existence. The elephant treads over it under the impression that it is *terra firma* and falls into it, when it is caught.

The elephant capturing operations last for six months each year, generally from the beginning of Vrischikam to the end of Medam. When a fall occurs, logs of timber are often laid across the mouth of the pits and tied together

with strong ropes to prevent the animal from escaping. A vigilant watch is also kept to prevent the victim from being rescued by its comrades. As a general rule no animal is allowed to remain in the pit for more than 48 hours. When the decoy elephants arrive, the captive is noosed round the neck and one hind leg, below the knee and above the ankle, by soft cords made of fibrous barks. Precaution is taken to prevent suffocation by the tightening of the noose on the neck. On the noose two pieces of cord about two yards long are attached on either side. It requires considerable skill and experience to put the two nooses round the neck and the leg. As soon as everything is ready for the animal's removal, billets of wood and twig are thrown into the pit to lessen the depth and to enable the captive to ascend and, as soon as he is out, the decoys close in round him. The ropes on either side of the neck are seized by two elephants and the noose cord itself by another in front, while a fourth elephant remains in the rear. The leg cord is held by a number of coolies and the captive is marched to the cage. The lower bars of the cage are drawn out sufficiently to admit it and it is pushed in. The bars are closed immediately the animal enters and the nooses are cut off. Mahouts are appointed to tame the captives. The training takes nearly two to six months.

Cardamom is one of the important minor forest produce of the State. It grows wild in the
Cardamoms. evergreen forests of Malabar, Travancore and Cochin at elevations between 500 and 1,000 feet above sea level.

Cardamom was a State monopoly till 1071 M. E. By 1071 the monopoly was abolished and a tax was imposed on the land instead. In 1074 the Cardamom Rules were again revised with a view to encourage the extension of cultivation. The provision regarding the enhancement of assessment from Rs. 8 to Rs. 10 per acre at the end of the 12th year

from date of paṭṭā or registration was cancelled in 1075 and a few other restrictions in regard to the payment of assessment, relinquishment of holdings and other matters were removed. In 1080, a conference was convened at Bombay by the Dewan, at which a large number of cardamom ryots were present.

The inhabitants of the State were more or less ignorant of the profits of cardamom cultivation nor was the conference intended to stimulate interest on the subject among the sons of the soil. As a result of the conference, however, full proprietary rights over the land were granted to the holders on payment of the prescribed price, viz., Rs. 10 per acre in ten annual instalments. The assessment was reduced from Rs. 6½ to Rs. 2 per acre. Outlet roads were opened to facilitate transport. A revised set of rules was passed. In 1084 the forests in the cardamom districts were transferred to the control of the Conservator of Forests and in 1085 the Cardamom Department was amalgamated with the Land Revenue Department. There is now a growing interest in cardamom cultivation. The Cardamom Hill Reserve comprises about 48,000 acres in the Dēvikuḷam division. The approximate total area under cultivation is 30,000 acres. It is not possible to estimate how much of the cultivated area is possessed by Travancoreans. The Government have recently set apart 10,000 acres of land to be registered in the names of private individuals (Travancoreans) only. The chief problems in the cultivation of cardamom are finance and marketing. Most of the cardamom cultivators are indebted to money-lenders outside. To relieve them, a co-operative cardamom bank was started in 1110. The marketing methods are bound to improve as the Paḷlivāsal-Nēriamangalam Road has brought the outlets for produce nearer to the producing area.

As already stated, ivory is a royalty and in olden days all the stock collected from the forests was sent to

the Commercial Office at Alleppey. But now they are sent to the Conservator's Office at Trivandrum where they are usually disposed of in public auction once every year.

The following are some of the more important minor produce.

- | | |
|-------------------|----------------------|
| 1. Cardamoms. | 5. Reeds, |
| 2. Honey and wax. | 6. Rattans. |
| 3. Ivory. | 7. Kulavoo oil, etc. |
| 4. Bamboos. | |

Government are getting a handsome revenue from the Forest Department as a whole. The following statement shows the receipts and expenditure of the Forest Department for the last 13 years :--

Year.	Revenue Rs.	Expenditure. Rs.
1100	13,52,888	7,60,792
1101	14,49,639	7,85,559
1102	15,18,660	7,91,509
1103	15,45,447	7,85,210
1104	16,04,755	8,55,909
1105	16,65,238	8,22,366
1106	14,00,552	8,50,674
1107	13,05,881	7,98,137
1108	12,03,353	7,98,549
1109	12,84,391	7,69,689
1110	13,46,279	8,08,435
1111	12,93,262	7,24,848
1112	12,79,189	7,06,646

The arrangement laid down by the Government for the protection of forests is efficient. The injuries to which the State forests are exposed are the following:

Protection.

1. Injury from man including theft of forest produce, damage to the forest or forest produce and trespass into the reserved forests.

2. Injuries from animals including birds and insects. The elephant does a lot of damage to the forest, especially to the teak plantations.

3. Injuries from fire and atmospheric influences, such as winds, floods, erosions, etc.

Protection against fire is the most important thing to be considered. More than two-thirds of the sylvan area in Travancore consists of grass forests. Formerly the havoc done by the grass fires which usually break out early in summer and continue till the commencement of the monsoon was indeed appallingly tremendous. "Lighted in the Valley, they spread over hills and dales and weeks afterwards are found travelling in places twenty miles distant from where they started. For 3 months in the year, the open grassy forests may be said to be burning from one end to the other". They destroy whole crops of woods, especially of the lower age gradations. Reproduction is stopped by the destruction of fruits and seeds and the growths of mature trees are retarded, so much so, they become stunted or stag-headed. The humus on the soil is completely burnt away and the soil is exposed making it hard and unsuitable for seeds to germinate. The burning of the soil-covering leads to soil erosion during the rains.

Forest fires occur in various ways. Usually they are intentionally lighted by graziers to obtain fresh grazing for the cattle and sometimes by poachers to secure game. Fires also occur from sparks from locomotive engines or by shooting in forests with rag or paper wards. Most commonly they occur through the carelessness of people who light fires and leave them unextinguished. Realising the evils arising from these annual fires, a scheme for protecting the teak plantations of the State was sanctioned in 1072. In 1073, the Government further sanctioned the appointment of fire

watchers during the dry season. But protection was then confined to the teak plantations and a small area of forests surrounding them. Experience, however, proved that the appointment of a few watchers and the cutting of a few miles of fire lines here and there would not prevent the occurrence of forest fires. Fires continued to occur in almost all the forests and the grass forests were destroyed. In 1095 the Government adopted a more vigorous policy in the matter of fire protection. Prior to the commencement of the fire season a warning notice against setting fire to the forests was published in the Government Gazette. Copies of this notice were distributed by tom-tom in the villages near all forest areas. The hillmen were particularly enjoined to use great care when kindling fire. Money rewards were also granted for successful protection. These measures were, however, not found to be sufficiently effective.

In 1100 the system of the early burning of the forests was introduced in all the forests. This was similar to the method adopted for the protection of grass forests in British India, where it was found to be more or less successful. According to this system, the grass undergrowth was burnt when it was still partially green. This of course took a lot of time and labour as the forests would have to be taken up block by block. Burnt grass will put on fresh green shoots in a short time and the areas so treated will be practically immune from fire during that season. This is the system of fire protection now adopted throughout the State and it has so far been found to be quite satisfactory.

The necessity for reserving convenient blocks of land near villages for grazing and for the collection of fodder was felt as far back as 1080, and the Government accordingly ordered in that year to provide grazing grounds wherever possible. The order was again renewed in 1081 and the attention of the Conservator of Forests was drawn to the desirability of providing grounds

at every agricultural centre in consultation with the Land Revenue Department. The want of sufficient land for communal purposes had even then assumed a serious shape in some of the taluks, as all the lands were already registered in the names of private persons. In consonance with the above policy the Conservator was ordered in 1082 to complete the settlement of the 25 grazing blocks already taken up for reservation and to arrange for fresh areas being constituted as fuel and fodder reserves. According to the existing grazing rules cows, bulls and buffaloes belonging to the subjects of the State are allowed to graze free in all reserves and plantations other than those closed against grazing. But the owners of such cattle will have to obtain free permits from the Divisional Forest Officers or the Range Officers. Cattle from outside are allowed to graze within Travancore forests (other than those closed to grazing) on payment of fixed fees for each season. The fees levied vary for different kinds of cattle. Out of a total area of 2,486 square miles of reserved forests and reserved lands, 24.5 square miles alone have been closed to grazing. Till 1085 there were two sets of grazing rules, one applicable to the High Range division and the other to the reserves and plantations in the other divisions. In 1086 those rules were amalgamated and a revised set of rules applicable to all parts of the State was sanctioned. In 1097 the rules for grazing and penning cattle in forest reserves, plantations and unreserved lands were again amended and enhanced rates of fees were fixed for cattle from outside. In 1111, the Government realised a revenue of Rs. 14,476 on account of fees from grazing permits and fodder grass.

Regulation II of 1068, as amended by Regulations X of 1071, IX of 1085 and IV of 1089, and the
Forest Offences. rules thereunder describe the Forest Offences. The more important offences under the Regulation are :—

(1) Clearing of land against sections 7 and 21 of the Forest Regulation.

(2) Setting fire to a reserved forest.

(3) Allowing cattle to trespass in a reserved forest.

(4) Felling, girdling or otherwise damaging a tree in a reserved forest.

(5) Illicit collection and removal of timber or other forest produce.

(6) Damaging, altering or removing a wall, ditch, fencing, etc., in a reserved forest.

(7) Felling reserved trees from land at the disposal of the Government.

(8) Felling royal trees whether found in government or private lands and being in possession of any such tree or forest produce which is a royalty, without having honestly obtained it.

(9) Counterfeiting upon any timber or tree a mark used by the Forest Officers or altering or defacing such marks.

(10) Killing, wounding or capturing wild elephants.

The Government have granted concessions to certain parties and have leased out large tracts of forests for long periods. The Kannan
 Concessions. Dēvan Hills Concessions and the Periyār Lease are the most important among these.

In addition to the large number of rivers and streams there is also a net-work of forest roads which connect all important forests and centres of forest
 Communications. working. Where cart roads cannot be taken except at prohibitive cost, bridle paths and fair weather roads have been made to facilitate inspection work. The existence of huge rocks in some of the rivers hampered floating operations very seriously in the past. The blasting of such rocks and opening of further

communications in the forests were considered by the Government as far back as 1030 when the first forest road was opened at Eḍarat. Rocks in the river beds were also blasted. Since then rapid progress was made in the construction of roads in places where water transport was found impossible. When the steepness of the ground and the smallness of the traffic made it unprofitable to open cart roads, a great many bridle paths were cut. There is now scarcely any estate or important timber-growing area in the forests which is not connected by a cart road, bridle path or a navigable river.

The transporting of timber is rendered easier by the development of communications. Recently arrangements have been made to extend the use of the softer kinds of timber by making them harder by artificial processes. In determining the value of timber its durability is of the utmost importance and the greatest attention has to be paid to the means of increasing it. In places where durable woods cannot be secured in sufficient quantity, it becomes all the more necessary to use less durable ones which can be treated by one of several processes in order to make them more durable. We have large quantities of woods which are considered not sufficiently durable and strong for constructive purposes. The question of artificially increasing the durability of such timbers by injecting them with antiseptic substances has been engaging the attention of scientists for the last several years and various methods and processes of injection have been now developed. The two chief processes that have gained currency at present are the "Creosote" and "Ascu".

In January 1935, Mr. Kāmeśam of the Dehra Dun Forest Institute brought to the notice of the Government the 'efficacy, economy, suitability and permanence of Ascu as a wood preservative' for treating electrical poles, bridge timbers etc., and offered to sell the patent to the Government on a

royalty of Rs. 15,000 payable immediately and a further sum of Rs. 1,000 annually from the 6th year to the whole life of the patent, i. e., up to the 14th year. As the Hydro Electric Scheme at Paḷlivāsal is in progress and as a large number of electric and telephone posts are required for transmission lines, the Government decided to use Ascu treated teak posts in place of steel and iron posts. They accordingly purchased the patent. The required machinery and chemicals were got down and the treatment of teak poles was started at Paḷḷam, a place four miles from Kōṭṭayam. It is a process by which a mixture of arsenic oxide, copper sulphate and potassium bichromate is injected into the timber at a very high pressure. The work there is now in steady progress.

The presence of hillmen in certain places is a special feature of the Travancore forests. The hillmen number 128,838 according to the Census of 1931.

Hill Tribes.

They are scattered throughout the forests but are chiefly found in those parts where the soil is good for cultivation and where good drinking water can be had. They are divided into 13 tribes.*

- | | |
|------------------|--------------------|
| 1. Kāṇikkār. | 7. Mannān. |
| 2. Malankuravan. | 8. Muthuvan. |
| 3. Malapaṇṭāram. | 9. Paḷiyan. |
| 4. Malapulayan. | 10. Thaṇṭapulayan. |
| 5. Malavēṭan. | 11. Uḷḷāṭan. |
| 6. Mala Aṛayan. | 12. Ūṛāḷi. |
| | 13. Vishavan. |

The Government have been bestowing attention for the preservation of wild life. As far back as 1045, the Government issued a notification prohibiting the shooting or otherwise killing of wild elephants on pain of fine, imprisonment or both. Rules prohibiting or regulating shooting within reserves were also

* For details see chapter on Castes and Tribes, Vol. I.

passed in 1075, 1081, 1088, 1089, and 1097. During the past the wild life of the country had ample security in the extensive forests and waste lands. But with the gradual depletion of the forest waste lands, the rapid extension of communications and the increasing use of fire arms many varieties of wild life appeared to be threatened with extinction.

Travancore like other states has therefore taken up seriously the question of the conservation of wild life, and special organisations have been constituted to prevent indiscriminate destruction.

In 1109 the Government sanctioned the appointment of a Game Warden under the Conservator of Forests. This special officer was directed to take immediate measures for the protection of game by creating game preserves at suitable places in the forests and by the formation of game associations. These associations are to look after the preservation of game, regulate hunting and shooting, introduce new species of animals and birds from other countries, and see to the prevention of poaching and such other offences. The Game Warden is invested with the powers of a Deputy Conservator, under section 59, c, d and e of the Forest Regulation.

A Game Association was constituted in 1110. His Highness the Mahārāja is the patron of the Association. A Game Sanctuary was also established in the High Range at Edappālayam.

Quantity and value of timber extracted and sold from
1082 to 1111 M. E.

Year.	Timber out-turn. c. ft.	Out-turn value. Rs.	Quantity of timber sold. c. ft.	Value realised. Rs.
1082	9,20,975	15,827	8,30,208	6,35,129
1083	9,30,175	20,341	9,28,172	7,06,502
1084	11,80,699	23,168	9,15,280	7,71,243
1085	8,85,590	27,232	9,90,012	7,32,805
1086	10,02,347	40,234	11,17,434	7,89,557
1087	12,59,268	33,599	11,10,788	7,89,931
1088	12,17,595	25,022	13,56,658	10,88,859
1089	13,70,275	39,939	12,72,798	11,05,228
1090	16,36,448	29,728	16,54,776	12,42,955
1091	12,38,552	11,726	12,06,606	11,57,266
1092	10,50,072	45,951	13,14,670	12,54,853
1093	11,82,557	40,178	9,19,367	12,75,142
1094	11,55,569	46,082	8,67,670	14,59,697
1095	10,68,193	35,344	7,97,152	10,96,812
1096	11,83,569	76,411	6,62,447	10,05,753
1097	8,26,667	68,402	11,04,542	13,39,519
1098	6,39,554	74,667	7,64,148	9,67,437
1099	7,93,174	74,331	9,46,355	11,24,881
1100	8,11,176	1,03,560	9,82,002	12,09,122
1101	11,16,138	1,02,383	10,15,660	13,02,670
1102	10,98,465	1,10,370	11,21,384	13,86,771
1103	11,40,889	1,08,369	10,12,875	14,11,828
1104	12,94,332	96,957	12,67,814	14,91,983
1105	13,74,463	99,565	12,57,205	15,95,097
1106	12,66,008	74,023	12,58,327	13,67,920
1107	12,16,421	74,184	14,60,655	12,74,803
1108	13,99,449	78,832	12,57,932	11,60,016
1109	12,95,667	79,413	13,37,597	12,49,091
1110	14,79,833	79,515	14,45,074	13,06,649
1111	12,40,208	79,808	13,69,352	12,92,151

CHAPTER XVII.

AGRICULTURE.

Travancore is pre-eminently an agricultural country. Fifty five per cent. of the earning population of the State live by agriculture. Of the total 31,00,000 acres of cultivable area in the State, over 25,00,000 acres are subject to some kind of agricultural effort. The meteorological conditions created by the monsoons and the geological changes of comparatively recent periods have been responsible for imparting peculiar characteristics to Travancore agriculture. Naturally therefore the conditions of agriculture in Travancore are different from those obtaining in the neighbouring British Indian districts. The undulating plains, irregular hill ranges, fertile valleys and navigable rivers have contributed largely to the agricultural development of the State. The high altitude and the distinctively temperate climate which the High Ranges enjoy and the low level of the coastal regions have made it possible for Travancore to grow in abundance the crops of both the tropical and temperate regions.

A feature characteristic of the agriculture of the Malabar Coast, particularly of Travancore, is the residence of the proprietors and tenants on the land itself. The ryots are mostly peasant proprietors who hold their lands permanently and on definite terms. They have thus every possible inducement to improve their little possessions. Some of the most important crops of Travancore are perennial in character, such as the coconut, the arecanut, the jack trees and the mango trees, the produce of which can be secured only if the ryot lives on the land. The permanency of the indigenous crops and the limited area of paddy land available have encouraged garden cultivation. The desire

to maintain exclusive possession induces the ryot to fence his holdings properly.

Nature is kind to the Travancore agriculturist. The south west and the north east monsoons visit the State with regularity. The ryots are more or less dependent on rainfall for their agricultural operations. The abundance of rainfall helps the cultivation of root crops throughout the State. Wet cropping, as it is understood, is practically non-existent in the State except in Nānjanād where the monsoon rain is scanty and most uncertain. Another special feature of Travancore agriculture is the cultivation of the Kuṭṭanād Punja. The land here is subject to inundation by the waters of the very many rivers that flow through and the soil is enriched annually by the flooded rivers depositing large silt and organic manure. Paddy is grown once every year after baling out the water. The plantation cultivation in the High Ranges, especially cardamoms, coffee, tea and rubber, is also a prominent characteristic. The plantains spread their broad foliage and thicken the shade of the trees above them in almost every garden in the State. The varieties of fruits grown throughout the country have attracted the attention of students of agriculture and visitors to the country as being a peculiarity.

The development of Travancore agriculture owes largely to the statesmanlike policy followed by the illustrious Mahārāja. The light incidence of taxation both on land and on trees has in a large measure been responsible for the encouragement of agriculture, especially garden cultivation. The sense of security consequent on good administration has also been the cause of cultivating in the ryot a distaste for the crowded discomforts of the village life of his brethren on the other side of the ghats. This no doubt has been responsible to a degree for granting to the Travancore cultivator the heritage of a habitat—that of residence of the landed proprietor and the tenant cultivator on

the holding. This residence habit has enabled the Travancore ryot to devote adequate attention to his cultivation.

The total area of the State is 7,625 square miles, of which one third is covered with forests. The cultivable area is 4,754 square miles. Of this 1,315 square miles of land are uncultivated. This includes current fallows and cultivable wastes, of which nearly 500 square miles have already been occupied. This area is being speedily taken up for cultivation. The Government have always been following a systematic policy of encouraging cultivation of all available land. The diagram on the next page shows the proportion of the cultivated area to the total area of the State in 1101 and 1111 M.E. The cultivated crops of Travancore may be classified as under:—

Area under cultivation.

- I. Wet.
- II. Dry.
- III. Garden.
- IV. Plantations.

Wet lands are those on which crops can be cultivated only with the help of a steady and copious supply of irrigated water through the period of their growth. Paddy is the only wet crop grown in the State. Cultivation depends solely on rainfall in dry lands. The majority of the crops are cultivated as dry crops. Ordinary garden products are raised in the garden lands where cultivation is done in the same manner as in the dry lands. The line of demarcation between the dry and garden crops is not very marked. A large variety of crops is raised in these garden lands. Plantation cultivation is confined to the hills. There are big estates in the High Ranges where tea, coffee, cardamoms, etc., are cultivated on a large scale. These plantations also depend for their crops solely on rainfall. It will thus be seen that really there are only two

kinds of cultivation—wet and dry, which include gardens and plantations. The latter type forms nearly three-fourths of the occupied area of the State. In 1111, of the total occupied area of 25,47,682 acres, 19,41,872 acres were under dry cultivation and the remaining 6,05,810 acres under wet cultivation.

The following are the principal crops of Travancore:—

1. Wet. Paddy.

2. Dry. Paddy.

Millets:—Thenā.

Chāma.

Varāku.

Ragi.

Kambu.

Chōḷam.

Pulses:—Cow pea.

Horse gram.

Red gram. Tur—Dhall

Green gram.

Black gram.

Edible roots:—Chēna.

Chēmpu.

Kācchil.

Tapioca.

Sweet potato.

Arrow root.

Chīvakkiḷangu.

Nanakiḷangu.

Mukkiḷangu.

Cherukiḷangu.

Cheruvalliḷikiḷangu.

Potato.

Oil seeds:—Gingelly.

Castor.

Lemon grass.

Oil seeds:—Laurel.

Maṛaveṭṭi.

Vēppu.

Kaṛiññōṭṭa

Fibre crops:—Sun hemp.

Cotton.

Agave, etc.

Drugs and narcotics:—Tobacco.

Ganja.

Condiments and spices:—Turmeric.

Ginger.

Pepper.

Coriander.

Cummin seed.

Mustard.

Fennugreek.

Karuva.

Cardamom.

Chillies.

Cloves.

Nutmeg.

3. Garden:—Coconut.

Palmyra.

Cycas.

Chūṇṭa pana.

Sugarcane.

Cashew nut.

Tamarind.

Cocoa.

Areca nut.

Betel vines.

Vegetables:—Gourds.

Beans.

Ladies' finger.

Drumstick.

Brinjals.

Vegetables:—Amaranthus.

Onions.

Garlic.

English vegetables of temperate climate.

Fruits:—Plantain.

Mango.

Jack.

Bread fruit.

Pine-apple.

Limes.

Pomegranate.

Rose apple.

Guava.

Pappaya.

Custard apple.

Mangosteen.

Ñārappalam.

Ñāval palam.

4. Plantations:—Tea.

Coffee.

Rubber.

The diagram on the next page shows the proportion of the area under the major crops to the total cultivated area of the State in 1101 and 1111 M. E. respectively.

The soils of Travancore vary in their nature according to the diversity of their situation. The soil of the elevated land reposes on a bed of laterite.

Soil. The more elevated parts are somewhat barren, producing only coarse grass and a few meagre shrubs. But their sides and bases are very fertile and support a luxuriant vegetation. The soil of the lower parts of the valleys consists of a brownish coloured clay of some depth, but of great variation, at some places a vegetable loamy

mixture washed from the neighbouring uplands, porous, permeable and readily yielding to the plough, at others a stiff clay requiring some exertion to turn it. The soil of the coast is fine sand with a mixture of calcarious clay as a lower stratum combined with vegetable matter. The uplands during the rains display some strength of vegetation but are comparatively barren for nearly half the year.

On the whole, the soils of Travancore are not very poor though not very rich. The general return of the best lands does not exceed twenty fold. The most fertile parts are Nānjanād in the south and Kuṭṭanād in the centre. The soil of Nānjanād is made up of a deposit of calcarious clayey soil watered by excellent streams and that of the latter is composed of alluvial depositions formed by the flooding of the rivers. The luxuriant growth of coconut plantations all along the coast is to be attributed to the underground current of subsoil water rich in food materials. The tree deteriorates as it reaches from the coast.

Travancore gets the benefit of both the south west and the north east monsoons. The whole of the country except the southern taluks and Shenkōṭṭa enjoys more or less satisfactory rainfall. There are some parts which get more rain than necessary. The Travancore seasons are calculated with reference to the monsoons. The regular rains at punctuated intervals enable the ryot to cultivate during both the seasons. For eight to nine months therefore the Travancore fields are under one crop or other. The ryot takes advantage of the advance showers of the south west monsoon to prepare the land. Both short time and long time crops are grown, the former requiring for their cultivation the duration of a single monsoon and the latter taking the duration of both the monsoons. There is a long spell of dry season for three months from the abatement of the north east monsoon to the bursting of the south west monsoon. Even

during this season vegetables are grown. The punja crop in Kuṭṭanād is cultivated only after the monsoon has totally receded. In the southern tract cultivation is done by means of artificial irrigation. In the central and southern taluks the paddy fields are rain-fed.

There has been as yet no systematic attempt at ascertaining the extent and size of the holdings. But an attempt was made in the course of the Agricultural Holdings census operations of 1931. Pages 490—491 of the Census Report seem to furnish the best available information on the point. The following quotations from the Census Report are instructive :—

“According to the returns of the Economic Census the area cultivated is 16,50,000 acres and the number of cultivators 629,887. The number of holdings may be taken to be the same as the number of cultivators, and in that case the average size of a holding is 2.62 acres. ‘Holding’ here means only the total area cultivated by an individual, irrespective of its being in one compact block or in scattered bits. Information has not been collected on this point and it is, therefore, not possible to examine the question of the fragmentation of holdings. The average size of the holdings, obtained by dividing the total area by the number of holdings, gives no clue whatsoever to the extent to which holdings have been sub-divided. An approximate idea of it can, however, be formed by classifying the holdings into groups on the basis of their size and finding the proportion in each group to the total number of holdings. These proportions worked out from the figures recorded in the Economic Census are given below :—

Size of holding	Percentage of the number in each group to the total number of holdings	Size of holding	Percentage of the number in each group to the total number of holdings
Below 20 cents.	5.94	5-6 acres	3.13
20-40 "	9.67	6-7 "	2.09
40-60 "	10.67	7-8 "	1.30
60-80 "	7.76	8-9 "	1.11
80-100 "	4.08	9-10 "	0.64
0-1 acre.	38.12	0-10 acres	95.53
1-2 acres	24.32	...	...
2-3 "	12.70	10-100 "	4.40
3-4 "	7.34	...	...
4-5 "	4.78	100 acres & above	0.07
0-5 "	87.26	...	...

"It will be seen from the above statement that about 38 per cent. of the holdings are below the size of one acre. In this group between one-third and one-half of the number is less than 40 cents and nearly two-thirds are less than 60 cents. Of the total number of holdings more than 87 per cent. are below five acres and as much as 95.5 per cent. below ten acres". In paragraph 72, chapter 1 of the Report, we have seen that an economic holding in Travancore should be at least 10 acres, and, if so, more than 95 per cent. of the holdings in the State are uneconomic.

The following table shows the distribution of holdings according to size in different communities as per the random sample:—

Size of holding	All commu- nities	Brahman	Nāyar	Ilava	Depressed Hindu	Other Hindus	Syrian Christian	Other Christians	Muslim.
Below 20 cents	1,776	8	340	323	122	383	194	217	124
20-40 "	2,892	5	633	608	173	628	341	344	160
40-60 "	3,190	12	719	559	241	663	454	347	195
60-80 "	2,320	4	575	448	137	452	327	251	156
80-100 "	1,221	2	370	241	53	155	220	109	71
Below 1 acre	11,399	31	2,637	2,239	726	2,286	1,536	1,238	706
1-2 acres	7,271	24	1,970	1,279	391	1,148	1,284	738	437
2-3 "	3,797	28	1,075	581	166	490	851	356	250
3-4 "	2,195	15	635	312	66	256	573	203	155
4-5 "	1,428	9	415	219	34	156	416	103	76
5-6 "	936	8	268	138	16	100	261	81	64
6-7 "	624	3	184	77	7	59	210	51	33
7-8 "	390	4	117	48	10	22	131	27	31
8-9 "	334	1	98	44	5	31	120	20	15
9-10 "	191	4	54	19	3	25	62	19	5
10-11 "	1,317	22	367	140	9	109	596	96	68
100 acres and above	21	...	4	3	...	3	10	1	...
Total holders	29,903	149	7,824	5,099	1,433	4,685	5,960	2,933	1,820
Total earners	55,803	296	9,910	10,413	6,219	9,864	8,863	7,501	3,237

The percentage of earners among the different communities, who have agricultural holdings, and the average size of the holdings are given below:—

Community	Average size of holding in acres	Percentage of earners having holdings
Brahman	5.91	50.3
Nāyar	3.12	79.0
Īlava	2.29	49.0
Hindu (Backward communities)	1.93	23.2
Other Hindus	1.93	47.5
Syrian Christian	4.46	71.3
Other Christians	2.00	39.1
Muslim	2.68	56.2

The great bulk of the land is very seriously affected and 95.5 per cent. of the holdings are definitely uneconomic. The evils of this kind of excessive sub-division and fragmentation of holdings are well-known. They impede cultivation and prevent permanent improvements to the land and the economic organisation of labour or capital. The growing of second crops is discouraged. Excessive fragmentation in course of time has resulted in the land being left uncultivated. It also causes enmity against neighbours leading to litigation and permanent feuds. The problem is receiving great attention throughout India. In Travancore also it has attracted the attention of thinking minds. The success achieved by the Punjab co-operators in their experiment of co-operative consolidation of holdings has stimulated thought and frequent references on the importance of the subject and the possible solution thereof have been made in the Houses of Legislature. In 1936, the Travancore Board of Agriculture constituted a sub-committee to consider the problem of land colonisation and consolidation of holdings. But the paucity of materials

prevented the Board from making any definite recommendation.

The principle of fallowing is not new to the Travancore ryot. Fallow implies a period of rest or recuperation for the land. It includes various methods which may be classified as under:—

- Fallowing.
1. Bare fallow.
 2. Bastard fallow.
 3. Green crop fallow.

In the first the land remains without a crop for a whole year, as in the Paṇamilams of Kuṭṭanād. In the second it is ploughed up and worked after removal of a first crop, preparatory to the sowing of a root or forage crop, to occupy the ground during the next season. In the third the land is sown with a green manure or leguminous crop. All these three kinds of fallows are found in Travancore. Though with the pressure of population and the growing desire for intensive cultivation, the regularity and duration of fallowing are seen to decrease considerably, a fallow in some form or other is still looked upon by the ryots as a necessity. The cultivators realise the importance of a period of renovation and cleaning after an exhausting crop. The lands are therefore ploughed immediately after the harvest in Dhanu and left uncultivated till Mēḍam. The early showers of the south west monsoon are taken advantage of and lands are ploughed again to be ready for sowing. This is possible only in lands where two crops are raised every year. In Kuṭṭanād where only a single crop is raised annually the lands lie fallow for a longer period. Formerly the practice was to cultivate the fields every alternate year, the land being thus allowed to remain fallow for one complete year. But the increase of population has brought about a change for the worse. The kara punjas are now being cultivated every year, the ryots leaving those fields fallow for the short period between the harvesting and the

sowing seasons of the preceding and succeeding years. A regular system of fallowing now obtains in Kuṭṭanād only in the kāyal punja lands.

In the malankrishi lands also the old practice was to leave a fallow for periods ranging from six to twenty years. At present the longest period of fallow extends only over a period of six years.

In some parts of Travancore the fields are under some kind of crop or other throughout the year. Ōṇāṭṭukaṛa is an example. There, two crops of paddy with a crop of gingelly in between is the rule. The practice is injurious. Gingelly is an exhausting crop and, if cultivation is continued for a few years without interruption, the lands will become very poor. To interrupt a fallow with an exhausting crop is inconsistent with the idea of rest and recuperation. To compensate for this exhaustion the soil has to be liberally treated and the intermediary crop should be of a definitely renovating kind. The Agricultural Department is popularising the use of proper manures and giving advice as to the proper methods of fallowing. The system of rotation of crops is not generally practised. In dry lands, however, rotation is becoming more and more popular. Most of the crops grown on garden lands, being of a permanent nature, do not permit of rotation. But in dry lands bare fallows are avoided as much as possible and the cultivation of some kind of catch crop is encouraged. Different kinds of pulses are grown between the main crops. The stubbles are subsequently used as manure for the succeeding crop. The remains of a leguminous crop after harvesting is valuable as green manure. Cereals alternating with sugarcane, tapioca, etc., are found useful to replenish the soil. The Agricultural Department has been successful in introducing lighter varieties of tapioca as an alternative crop which helps rotation.

Mr. J. A. Voelkar says that anyone who has watched the clever devices of the native cultivators in the implements they use for fallowing, levelling, drilling, raising water, etc.,

will see that if anything is to replace the existing implements it must be simple, effective and cheap. This is quite true of the implements that are in use in the State as well.

There is a large number of agricultural implements which are in use. They are mostly made of indigenous materials with local labour. Their shape and form were dictated by the necessities of the time when they were invented. Long habits persuade the agriculturists to use them in the same manner as their forefathers did, though the demands of intensive cultivation call for improved implements. The Agricultural Department is interesting itself in the introduction of improved implements. The following are the important implements.

The plough. The plough is the most important of the implements used by the cultivators of Travancore. It is used for breaking up the soil. The plough has often been made the subject of attempted improvement. But the old wooden plough holds its own and may probably continue to do so for some time to come. It consists of a tongue of wood fitted with an iron tooth, a stilt for holding and a pole to be attached to the necks of buffaloes or bullocks. This instrument varies very much in size, weight and form in different parts of the country. Local conditions also determine the shape and the size. The country plough is condemned because it is not capable of inverting the soil due to the absence of the mould board. It only makes V shaped furrows leaving ridges of unploughed land and causes considerable waste of energy. The Agricultural Department is therefore advocating the use of improved ploughs.

The Climax Plough (invented by Messrs. Massy and Co., Madras) was the first to be recommended. The whole of this plough is made of iron except the handle or stilt which alone is made of wood. Its weight does not exceed 25 lbs. It can be easily drawn by the local bulls. The field can be

ploughed four inches deep and six inches broad by the use of this type of plough. The ploughshare has three or four cuts which are useful to make the furrows broad and deep. It is so designed that both tall and short legged bulls may draw it. The climax plough stirs the soil completely. Its price is about Rs. 9, while that of the country plough is only Rs. 4. As it was found that even the price of Rs. 9 for this improved variety of plough was too much for the Travancore farmer, attempts were made to introduce a cheaper variety of iron plough which costs only Rs. 4. It has an adjustable share which can be had separately for four annas a piece. The plough was put into the market by Messrs. Burn & Co., Madras. Later on, when the Department of Agriculture in the United Provinces introduced "the Meston Plough," the Travancore Agricultural Department also made attempts to make it popular. It consists of many adjustable parts which can be had separately. The share costs annas eight only. The plough can be used by both tall and short types of bulls. It is light and very easy to work. It has a mould board which can be adjusted according to the requirement of the furrow. It is so well-balanced that it needs but the minimum effort on the part of the ploughman.

The comparatively high cost of these ploughs stood in the way of their becoming popular. Indigenous effort has therefore been stimulated to put on the market a cheaper variety which is a happy combination of the cheapness of the original country plough and the effectiveness of the imported manufactured variety. A blacksmith of Pallikkal has introduced "the Pallikkal Plough" which has been made under the directions of the Department of Agriculture. It costs only Rs. 4 and has become popular because of its cheapness, strength and utility. A still cheaper variety costing only Rs. 2 has been manufactured by the Agricultural Department. This is called the "Always Plough". Its use is, however, confined to sandy soils.

Levelling board:—This is a heavy wooded plank generally drawn by bullocks or buffaloes to level the land. The levelling board is used when the field is prepared wet. The serrated formation at the low edge permits the water to flow through while working. The type varies with the locality. A kind of clod crusher is used in the taluks of Changanāssēry and Kōṭṭayam while a levelling board and a levelling beam are used in Kōṭṭāṭakara and other places. The levelling beam is used both in dry and wet seasons. This also is worked by a pair of bullocks. When used over dry land, it works as a clod crusher. In the northern taluks the ryots use another type named Ñavaṛi for levelling the puddled land. In Shenkōṭṭa a slightly different type known as Planker is used.

Rake, Harrow, etc.:—The rake is used to break the surface clods after the plough has been used, to bring up clods to the surface to be afterwards smashed up, and to detach weeds from the soil which has been stirred. The harrow more or less resembles the rake and is used for the same purpose. They are also used to cover the seed after it has been sown. The harrow and the rake used in Travancore are all made of wood. Their forms vary with the localities.

Seed drills:—After ploughing, harrowing and levelling, the land becomes ready for sowing. Sowing is generally done by dibbling or broadcasting and rarely by drilling. In Shenkōṭṭa a system of drilling is in vogue. It is worked by a pair of bullocks and directed by a man, while another (usually a woman) drops the seeds in the bowl little by little, which go down through the tubes and fall in the three furrows made by the three prongs. It is fit for dry sowing. The depth is regulated by dipping or by raising the beam. Seeds may be sown from 1" to 4" deep. With the help of this implement, it is possible to sow three to four acres a day.

Interculturing and weeding implements:—When the seedlings sprout, hand-weeding becomes necessary in the

case of almost all crops. A small digger with an iron blade and wooden handle called Khurpi or Kaṭhi is used for this purpose. The soil between the spaces of plants should be constantly stirred and for this different kinds of hoes are used. Worn out mammaṭṭies are used for intercultivating, weeding and mulching dry crops as Chōlam, Black gram, etc. Kūnthālies, mammaṭṭies, kalamānthies, and P. C. Digger* are different kinds of implements that are in use in different parts of the State for interculturing and intercultivation. The implement used for this purpose in Shenkōṭṭa is called the Dhundia. A pair of Dhundias is fastened on to a long bamboo and drawn by a pair of bullocks. This device saves a lot of time to the ryot.

The appliances used for this purpose include those for drainage also, as in some parts of the State, Kuṭṭanād

Irrigation. for example, the problem is one of draining out and not baling in the water. These appliances vary with local conditions. The process of irrigation and drainage also differs widely. Manual labour is employed in some parts of the State while bullocks or buffaloes are used in some others. The most important appliances in use in the State are:—

- (i) Pikota,
- (ii) The Baling Spoon and the Baling Basket,
- (iii) The Water Wheel.
- (iv) The Ghamela or the Mhote.
- (v) The Water Pump or the Steam Pump.

The Pikota is used for irrigating fields from small depths, say 10 to 12 ft. This is a long lever mounted on a central vertical fulcrum. At one end of the lever a suitable weight is attached and at the other a water bucket is tied to a long bamboo pole. The weight at the end is sufficient to raise the water bucket when full. A man stands at the bucket to drain the water into the channels. To assist him

* Improved by Mr. P. C. Krishna Pillai, Agricultural Demonstrator, Ochira.

ropes are also tied on one or both sides of the central pivot at which a second man pulls now the one and now the other as the bucket is raised and lowered. This is fairly common in many parts of the State.

The baling spoon and the baling basket — The baling spoon is suspended by a rope on a tripod and worked by manual labour. It is made of wood. The spoon is useful only for lifting water to a small height ranging from 1 to 3 ft. The baling basket is generally made of wicker and is used for lifting water to the height of 10 ft.

The Water-Wheel. — A wooden wheel of light frame turns on an axle which rests on two pivots. The pivots are fixed on the sides of the channel for the wheel. Bamboo racks are attached to the wheel, where a man sits and negotiates the leaves of the wheel. The wheel revolves by which action water enters or goes out through the wooden pipe. This is used more for drainage in the Kuṭṭanād tracts.

The Ghamela or the Mhote -- This is known to be the cheapest water-lift appliance. It is worked by bullocks. At the end of the rope a bucket is fitted with a leather discharging trunk. This is used mostly in Shenkōṭṭa.

Pumps. -- Engine-driven pumps are now becoming a popular drainage appliance.

Besides the above, there are various other minor implements which are used in connection with cultivation. They are the *veṭṭaruvāl*, the *thāmpa*, the *veṭṭukaḥi*, *kūnthāli*, *pāra*, *kōḍāli*, etc.

Harvesting and threshing appliances are few. The scythe and the sickle are the principal ones. Winnowing is done mainly by throwing the threshed corn against the wind. A three-rimmed basket made of wicker is ordinarily used. The grain is dried in the sun on mats made of reeds, screwpine or palmyra leaves. A threshing floor is used for keeping the harvested corn for threshing and winnowing. Bullock carts, head loads and canoes are used for trans-

porting the harvested crop from the field to the cultivator's house. The grain after drying is stored in arās, paṭhāyams, and pānas.

The cultivator generally owns the necessary implements. This reliance on one's own implements has worked a great deal against the introduction of improved varieties. The cost of new implements and the disinclination to use hired ones have been responsible for the failure of the attempts to introduce new and better implements.

An attempt was made in 1931 to take a census of the agricultural implements. But the returns were not satisfactory. It was, however, found that the total value of agricultural implements was Rs. 205 lakhs and that the average per earner was Rs. 52.*

The maintenance of the fertility of the soil is the most important requisite in any rational system of agriculture. In the methods of production that

Manure.

are ordinarily followed now, fertility is being steadily lost. The analysis of soil samples conducted by the Agricultural Department has revealed that the bulk of the arable areas have reached the lowest level of their productive capacity. The soil is deficient in humus, nitrogen and phosphoric acid, which play a vital part in the economy of crop growth. The impoverished nature of the soil is the cause of the low yields and leads also to the deterioration of the livestock. This necessitates the introduction of ingredients in which the soils are lacking.

The manure problem in Travancore agriculture is therefore very important. In former times the agriculturists depended on cattle manure, green leaves, ashes and rarely country wastes. These are all, no doubt, very good manure. But unfortunately cattle manure is not available in sufficient quantities to meet even a twentieth of the demands of the arable areas of the State. It has been calculated that with

* Travancore Census Report, 1931, p. 480.

the available cattle manure in the State it would be possible for each acre of cultivated area to get only one-fourth of a ton, while a minimum basic dose of five tons of manure is needed for every acre. To make up for this insignificant supply of farm yard manure the Agricultural Department has been popularising the use of oil cakes, fish manure and green leaf manure. The available quantity of these substitutes would have been enough to supply the deficiency in farm yard manure. The problem of manure is engaging the anxious consideration of the Department of Agriculture. Attempts are being made to remedy this want by the application of artificial fertilisers like ammonium sulphate, superphosphate, sodium nitrate, ammophos, etc. But the programme has not hitherto shown any notable results.

The want of response to the need of artificial fertilisers in many soils of Travancore is largely due to the fact that soluble ingredients are not retained in the soil for the required period of time for them to act and produce their effect, but are easily washed away in the heavy rains. In such a state of affairs it is in the supply of the necessary amount of humus in the soil that relief is to be sought, because well decomposed organic matter, on account of its absorptive capacity, is able to retain the nutrients and to gradually liberate them for the use of the plant. Experiments have also shown that the continuous use of artificials without proper admixture of organic manure destroys the texture and structure of the soil so essential for the aeration of the roots and for the efficient growth of the plants. A well-regulated supply of organic manure is essential to successful agriculture. The Department of Agriculture is making efforts to tap the various sources of waste materials in the State and make composts out of them for common use.

WET CROPS

The only wet crop that is raised in the State is paddy. It is the staple food crop of the people and is being cultivated

in 7,01,388 acres or 31·5 per cent. of the total cultivated area. This acreage includes 1,70,000 acres

Paddy. of single crop and 5,31,358 acres of double crop lands. The total area is made up of 55,351 acres in Nānjanād, 1,67,176 acres in Kuṭṭanād, 30,000 acres of kārī lands and the rest scattered in several parts of the State. The area under cultivation has been steadily increasing.

Paddy is a native plant of semi-aquatic habit, and grows well in a clayey loam soil with abundance of organic ingredients. The chief wild habitat of the plant is, roughly speaking, from Southern India to Cochin-China. That belt of land has often vast marshy expanses with low intervening mountains and possesses a tropical climate as also strong periodic seasons of rainfall. Inundations suitable for the growth of rice are therefore of annual recurrence. The cultivation of paddy appears to have spread from thence eastward to China, perhaps 3,000 years before the Christian Era, and at perhaps a slightly more recent date, westward and northward, throughout India, to Persia and Arabia and ultimately to Egypt and Europe. An enlightened people like the Chinese might be supposed to have more readily realised the importance of rice cultivation than the aboriginal tribes on the hills and swamps of Lower India where a sufficiently abundant supply for their wants could be gathered from the wild plant. This assumption is justified by the fact that the aboriginal tribes of Australia remain satisfied to the present day with their wild rice without taking a thought as to its cultivation*. Its indigenous character is further evidenced by the wild awned varieties of vārī and āra nellās seen even to-day in the forests of Travancore.

Paddy is cultivated throughout Travancore both on the hills and on the plains. The hill cultivation is called malankrishi and that on the plains nilamkrishi. The

* Dictionary of Economic Products of India, Watt, page 519.

virippu, the munṭakan and the punja are the crops raised for nilamkrishi. Nānjanād and Kuṭṭanād are the chief paddy cultivating tracts in the plains. Paddy is cultivated also in valleys of hills, low-lying areas and in all other places where water is available. The varieties of paddy cultivated in Travancore are many. Dr. Watt is of the opinion that the total number of named cultivated rices alone might come to 10,000.† A more or less exhaustive classification of the varieties of paddy cultivated in different parts of the country is given under each heading.

The duration of the crop varies considerably with the variety. A very strong relation exists between the yielding capacity and the duration of the crop. The longer the duration, the higher will be the yield. The varieties range from a two months' duration crop to a ten months' duration crop. The punja lands always prefer a three months' crop. Red rice is the commonest variety cultivated in the State, as the coarse grains are the most popular varieties. Long duration varieties are taken in the virippu lands in the second season.

Nānjanād comprises the taluks of Thōvāḷa and Agasthīswaram. These are the driest parts of the State. The rainfall in the major portion of the tract is only 40 inches, so much so that cultivation entirely depends on irrigation. The Kōthayār Irrigation Project with channels and distributaries of a total length of 322 miles irrigates the fields in this tract. There are also several tanks. The acreage under paddy comes to 55,351 acres in the Nānjanād tract. A considerable portion of the paddy lands is owned by investors from other parts of the State and outside. The natural consequence of this is that absentee landlordism prevails to a greater degree here than in the other parts of the State. Generally two crops of paddy

† Watt, p. 529.

are raised here. One is called the *poḍi vitha* and the other *nīr vitha*.

In preparing the land the stubbles left after the previous harvest are gathered and burnt towards the end of

Minam on the eve of the monsoon. The *Poḍi vitha*.

field is then ploughed thrice continuously and levelled with a rake. Big clods or lumps of earth left undisturbed are broken into small pieces and the field is smoothed and levelled with a rake once more.

After this comes again the manuring. Manure in olden days consisted of cattle manure, ashes and alluviums. The problem of manure is becoming acute day by day as the supply of cattle manure is diminishing. The cattle kept for transportation purposes are very limited and hence the manure obtained from them is naturally getting very much reduced. Green manure plants also are becoming scarce. *Nānjanād* lands are therefore becoming deficient in organic manure. To make up this deficiency, the Agricultural Department is encouraging the use of laurel cakes, fish refuse, etc. The leaves and branches of jungle shrubs or weeds obtained from dry waste lands and fallows are also used as manure. In some parts, herds of sheep are penned on the fields for the benefit of the manure from their excreta.

The seed is sown on or before the tenth of *Mēḍam*, the *Paṭhāmudayam*. But on account of the irregularity of the monsoons sowing is sometimes done a few days later. The seed rates for dry sowing and wet sowing are 12 *maṛakkāls* or 108 lbs. per acre and 10 *maṛakkāls* or 90 lbs. per acre respectively.

Several varieties of seeds are sown. A more or less exhaustive list of the varieties is given in the following table :—

List of important varieties of paddy cultivated in Nanjanad.

Field Paddy.

No.	Name	Sown or transplanted	Duration	Season	Remarks.
1	Sorna varī	Sown	4 months	Kumbham	
2	Kada Kaluthan	Do.	Do.	Do.	
3	Vilankan	Transplanted	Do.	Do.	
4	Manavarī	Sown	3½ months	Do.	
5	Maruthaveḷḷa	Transplanted	4 months	Do.	
6	Kadakanni	Do.	Do.	Do.	
7	Karimulakāi	Sown	3½ months	Do.	
8	Chemilaki	Do.	Do.	Do.	
9	Jirakamulaki	Do.	Do.	Do.	
10	Veḷḷamulaki	Do.	Do.	Do.	
11	Manjamulaki	Do.	Do.	Do.	
12	Kāttadimunṭan	Do.	Do.	Do.	
13	Kattikariminnan	Sown	4 months	Do.	
14	Viriyan	Do.	Do.	Do.	
15	Karikuruva	Do.	Do.	Do.	
16	Kallunḍan	Transplanted	Do.	Kanni	
17	Karuṭharikiravi	Do.	Do.	Kumbham	
18	Cheruyikichempa	Sown	5 months	Do.	
			Do.	Kanni	

List of important varieties of paddy cultivated in Nanjanad. (continued)

Field Paddy.

No.	Name	Sown or transplanted	Duration	Season	Remarks.
19	Chirālaki	Sown	3½ months	Kumbham	
20	Chuttiyiryan	Do.	4 months	Do.	
21	Cheruchuntan	Do.	Do.	Do.	
22	Kāttukuruva	Do.	Do.	Do.	
23	Darpakkuruva	Transplanted	Do.	Do.	
24	Kuttalam	Do.	Do.	Do.	
25	Mikkuruvu	Sown	4 months	Kanni	
26	Kunjavella	Do.	Do.	Do.	
27	Kunippan	Do.	3½ months	Kumbham	
28	Kallanchempa	Transplanted	6 months	Do.	
29	Koḍanariyan	Do.	Do.	Do.	
30	Chennel	Do.	3½ months	Kumbham	
31	Kattivella	Sown	4 months	Kanni	
32	Bhathakalikaruppan	Do.	3 months	Kumbham	
33	Muntakan, red	Do.	Do.	Do.	
34	Do. black	Do.	Do.	Do.	
35	Palliparaya	Do.	4 months	Do.	
36	Chuttiariyan	Do.	6 months	Do.	

List of important varieties of paddy cultivated in Nanjanad (*continued*).

Field Paddy.

No.	Name	Sown or transplanted	Duration	Season	Remarks.
37	Ouvella	Sown	3 months	Kumbham	
38	Manjavali	Transplanted	6 months	Do.	
39	Vettikanṭan, large	Do.	Do.	Do.	
40	Do. small	Do.	Do.	Do.	
41	Chingunni	Sown	3 months	Do.	
42	Kuravakkalayan	Do.	Do.	Do.	
43	Sīma nel	Do.	Do.	Do.	
44	Athikkirāvi Vella	Transplanted	4 months	Do.	
45	Kasthūri chamba	Sown	5 months	Do.	
46	Chempaka mārthāṇḍan	Do.	4 months	Kanni	
47	Kulakkuruva	Transplanted	Do.	Kumbham	
48	Karuḥathattāravella	Do.	5 months	Do.	
49	Palanthattāravella	Do.	6 months	Do.	
50	Kallanthattāravella	Do.	Do.	Do.	
51	Kiracchempa	Do.	5 months	Do.	
52	Chadayari, black	Do.	Do.	Do.	
53	Do. white	Do.	Do.	Do.	
54	Vellathattāravella	Do.	Do.	Do.	
			6 months	Do.	

List of important varieties of paddy cultivated in Nanjanad. (continued)

Field Paddy.

No.	Name	Sown or transplanted	Duration	Season	Remarks.
55	Anakkompan	Transplanted	6 months	Kumbham	Exotic introduced by the Agricultural Department.
56	Kuṭṭi Anakkompan	Do.	Do.	Do.	
57	Chempulī	Do.	Do.	Do.	
58	Muthuvella	Sown	4 months	Kanni	
59	Kunpala	Transplanted	Do.	Kumbham	In Kumbham also there is cultivation but the yield is poor.
60	Valsiramuntan, black	Do.	6 months	Do.	
61	Do. white	Do.	Do.	Do.	
62	Jirakacchempa	Do.	5 months	Do.	
63	Karthuka Sampa	Sown	3½ months	Kanni	
64	Poly Chorimpu, black & white				
65	Kundumany chempa	Transplanted	5 "	Kumbham	
66	Vellaccherunel	Sown	3½ "	Kanni	
67	Koṭhamallicchempa	Do.	3 "	Do.	
68	Virvatangan	Do.	3½ "	Do.	
69	Thuyamallicchempa	Do.	4 "	Do.	
70	Mūttakkuruva	Do.	3½ "	Do.	
71	Sampa	Do.	4 "	Do.	

List of important varieties of paddy cultivated in Nanjanad. (*concluded*)

Field Paddy

No.	Name	Sown or transplanted	Duration	Season	Remarks
72	Panamkuruva	Sown	3½ months	Kanni	
73	Puluthupuratti	Do.	3 months	Kumbham	
74	Aruvālkuruva	Do.	2 "	Do.	
75	Karuppukali	Do.	3 "	Do.	
76	Chempalingom	Do.	6 "	Do.	
77	Vālikaruppan	Transplanted	3½ "	Do.	
78	Thankacchempa.	Sown			
	Sornavari	Do.	Do.	Kanni	
79	Chithrakali	Do.	Do.	Kumbham	
80	Nayicchempa	Do.	Do.	Do.	
81	Gunacchempa	Do.	Do.	Kanni	
82	Kuttacchempa	Do.	Do.	Do.	
83	Mappilacchempa	Do.	Do.	Do.	

The dry sowing for poḍi vitha is done by either dibbling or broadcasting, the latter being the method more usually followed. But the dibbling method also is sometimes resorted to as it affords greater facilities for weeding. Immediately after sowing the field is again ploughed and smoothened. Raking is repeated a few days after sowing. The seed begins to sprout on the fifth day, but the sprout becomes perceptible only on the seventh or subsequent days. If the sowing is done in time, the field is exposed to the sun for about 25 days when the south west monsoon sets in. A full-grown plant attains to a height of three to four and a half feet. If it thrives well, it will have on an average five to fifteen shoots from the stem. The average yield per acre on a fair land ranges from ten to fifteen fold. It is a matter of great importance to the rice plant that its drying should not be disturbed by rains falling during the 25 or 30 days after its sproutings. If it rains during this interval, the yield will materially suffer. After the rains the weeds begin to appear. These should be removed once or twice. About the beginning of Chingam the earheads appear and ripen within a month, when they become fit for reaping. During this time the fields are supplied with water, which is allowed to stand two inches deep. This is ultimately drained off to expedite ripening and facilitate reaping.

Nīr vitha. As soon as the Kanni crop is harvested, the fields are got ready for the next crop, that of Kumbham, (February-March). The varieties of paddy grown now are Valsīramunṭan and Ānakkompan. The agricultural operations of this season are called nīr vitha. There must be sufficient water in the fields for this crop all the time. After irrigation, the field is manured with farm yard manure, other refuse and green leaves, etc. The manure is then ploughed into the soil. The ground is thus covered over with water which is allowed to stand for about two inches above the surface and is again ploughed up into a deep mud. The leveling board is then drawn over the puddle to make the surface

even and smooth. This done, the ground is ready to receive the seed or seedling. Before sowing the grain is soaked in manure and water for nearly 36 hours and it is tied up in a basket or vessel covered with straw. A little water is then sprinkled upon the cover and a weight put over the same. It is occasionally exposed, when it begins to germinate. The seeds are then sown thickly in the nurseries. A month after the appearance of the seedling above the ground the plant will be about a foot in height and fit for transplantation. The seedlings are transplanted at a distance of six or nine inches from one another.

Weeding has to be done twice or thrice and overcrowding has to be prevented by the removal of the surplus seedlings. The earheads begin to form about a month before the crop is mature and a fortnight before the harvesting which is generally begun after the whole plant, leaves and ear assume a yellow colour. The fields are drained off the water and allowed to dry. The harvest is gathered in the month of Kumbham (February-March), which gives the name to the crop. After the rice stalks have been cut by means of a short sickle, they are tied in bundles and carried to the threshing floor. The stalks are spread and beaten smartly with long bamboo sticks or are trodden by cattle until the grain is separated. The straw is then dried and tied into bundles. The grains are winnowed, dried and taken to the granary. The straw forms the chief dry fodder for the cattle throughout the year.

The method of cultivation followed in Eḍanād (Kalukūḷam taluk) resembles more or less that of Nānjanād in most of its features. The Veṭṭivaippu system of transplantation is peculiar to the place.

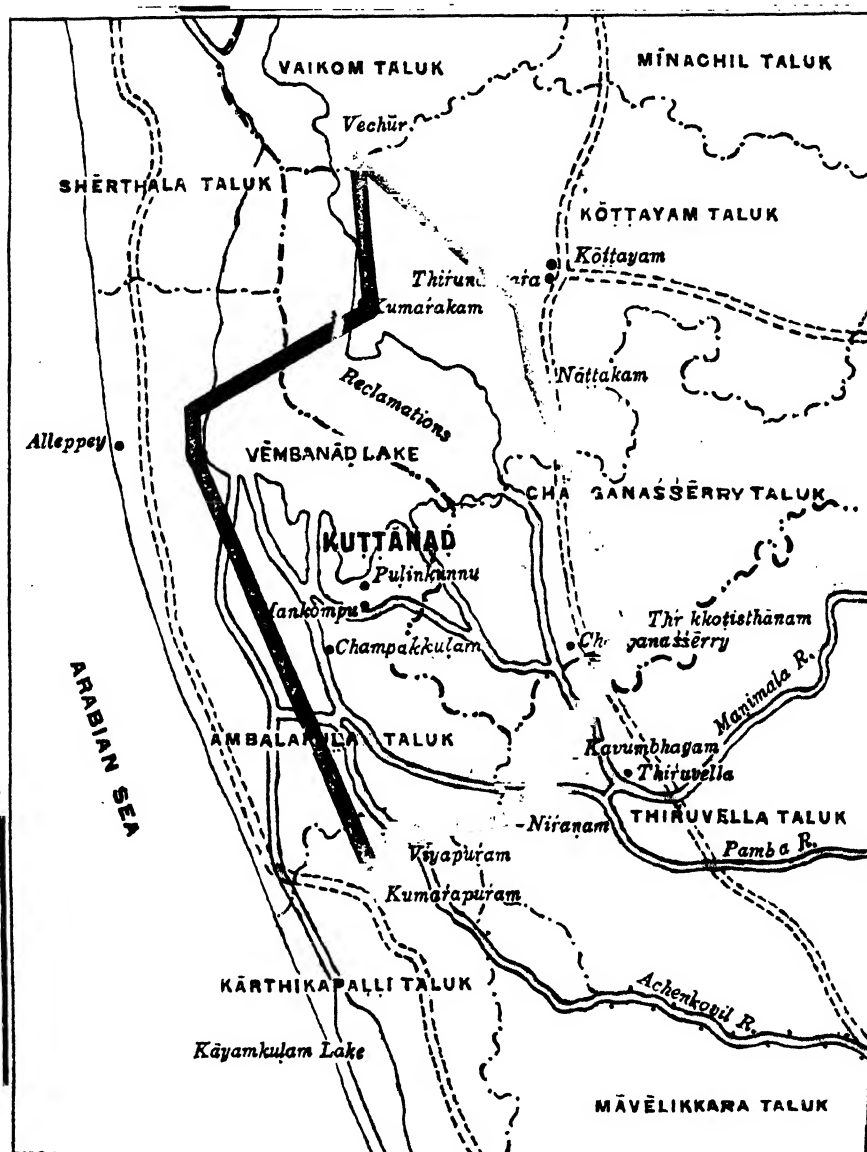
Onāṭṭukaṛa comprises Kaṛunāgappally, Kārthikapally, and portions of Quilon and Māvēlikaṛa. But the

Onāṭṭukaṛa. ryots are very industrious and the crops owe more to their industry than to the fertility of the land. The method and natural condition of

cultivation in Ōṇāṭṭukaṛa differ from the Nānjanād system. The fields are entirely rainfed. The season is the same as in Nānjanād. The holdings are comparatively very small. Ash is the manure in common use. Both dibbling and transplantation methods are followed. During the monsoon period the plant and the field are heavily manured. Two crops of paddy with a crop of gingelly in between is the rule. The gingelly crop serves the purpose of rotation. The average yield is less than in Nānjanād. A list of the varieties of paddy cultivated in Ōṇāṭṭukaṛa is given below:—

Name	Season	Duration	Average yield
Chuvanna Chāra	Punja-Vris: to Mēdam	Long	Depends on soil 10-30 fold
Cherumallaṛiyan	Do.		Do.
Chempāvu	Punja & Virippu		Do.
Chaudana Kunuka	Punja		Do.
Chennellu	Do.		Do.
Vaikatharyan	Do.		Do.
Vallala	Punja & Virippu		Do.
Malavallala	Punja		Ten fold
Anakkōṭan	Punja		Do.
Kocchuvīḥu	Punja & Virippu		10-30 fold
Thunippavu	Punja & Virippu		Do.
Maila	Do.		Do.
Kappacchampāvu	Punja		Do.
Jīrakacchampāvu	Do.		Do.
Ṇavaṛa	Do.		0 to 15 fold
Koṭungallār Kuruka	Do.		Do.
Nēnthrappally	Do.		0 to 25 fold
Patanvella	Do.		Do.
Karaṭhachāra	Do.		Do.
Jīraka Kuruka	Do.		Do.
Athikkiṛam	Punja & Virippu		0 to 20 fold
Kuḷappāla	Punja		Do.
Munṭakan	Punja & Virippu		Do.
Mulanachampāvu	Do.		Do.
Munṭaka Kuruva	Do.		Do.
Kallaḍacchempāvu	Do.		Do.

MAP OF KUTTANĀD



Munṭakan :—This crop is raised in all parts of Travancore. It is generally cultivated at a lower level than the virippu, where there is no scarcity of water. The lands in the vicinity of rivers rich with alluvium are highly favourable to its cultivation. In such cases manuring is not necessary. It is a single crop and a wet crop as well. The fields are prepared in the months of Chingam and Kanni, when the seeds are sown or seedlings transplanted. The harvest is in Makaram or Kumbham. Munṭakan is a six months' crop. The earhead of the plant always keeps above the water level. Munṭakan is cultivated also in salt water, when it is called ōrumunṭakan.

The conditions in Kuṭṭanād are entirely different from those obtaining in Nānjanād and Ōṇāṭṭukara. Here

the major portion of the lands is under
Kuṭṭanād. water during a considerable part of the
 year. The area covers 22 pakuthis in the taluks of Ampalapula, Vaikom, Kōṭṭayam, and Changanāśśery. Throughout this tract the fertility depends on the silt deposited by the Pampa and other rivers. Paddy cultivation in this tract is called the punja krishi. There are 1,67,176.48 acres under paddy in Kuṭṭanād. The soil is a clayey loam with organic ingredients in certain places.

The Punja land falls under three classes:—

1. The Kaṛappāḍams.
2. Kāyal lands.
3. Kaṛi lands.

Kaṛappaḍams :—Of these the oldest are the kaṛappaḍams situated on the banks of rivers and water courses. They get the advantage of the silt brought down by the floods. The plants grow luxuriantly and tall; but the earheads are smaller in proportion to their rank growth. There is deficiency of phosphate in these soils and the application

of phosphatic fertilisers has increased the yield. The yield is above ten fold and the cost of cultivation has been estimated at 27 to 30 rupees per acre.

Kāyal lands :—Lands reclaimed from the Vēmpaṇāḍ lake are the most extensive of the punja lands. Reclamations appear to have begun so early as 1009 M. E. if not earlier. The Government encouraged cultivation by exempting the reclaimed land from taxation for sometime. It was known as the Ninthan system. Loans were also given to the cultivators in view of the enormous expenditure incurred in preparing the land and cultivating it. Regulation IV of 1074 was passed to give the ryots every possible encouragement in the matter of cultivating kāyal lands. After a time, however, the Madras Government advised the Government of Travancore to place an interdict on the expansion of such cultivation on the ground that reclamation would injure the Cochin Harbour by narrowing the channel, lessening the ebb and flow of the tides and damaging the bar and the port. A great deal of correspondence took place. Eventually, thanks to the labours of the late Mr. A. H. Bastow, the Chief Engineer of the State, the prohibition was withdrawn and the reclamations were permitted to continue. The reclaimed area extends to 50,000 acres.

The lands are reclaimed from backwaters having about 8 to 10 ft. of water. The soil in this area is a heavy clay. The construction of bunds is a very difficult process. The bunds are made firm and the water is pumped out and paddy sown by the end of November or early in December. Exactly the same process is followed here also as in the kaṛappāḍams. For the first two or three cultivations after the lands were reclaimed no ploughing was done, but now the lands are ploughed just after the harvest is over and before the water gets in either by rain or through breaches in the bunds. No ploughing can be done in water in such lands as the water is too deep for the animals and men to

get into. Manuring is seldom done. It is not uncommon to apply a dose of slaked lime at the rate of half a ton per acre when the crop is about twenty days old. The crop is harvested in February or March. Short-duration varieties of paddy alone are raised, which have 85 to 90 days' growth. It has been observed that the paddy grows very well during the first month, but in the second month the growth gets retarded and in the third month yellowing of plants in patches occur. On the advice of the Agricultural Department, the land is being treated with lime, ammonium sulphate and superphosphate. The yield is fourteen fold and the cost of cultivation comes to Rs. 40 - 45 per acre. The first two crops immediately following the reclamation yielded 2 to $2\frac{1}{2}$ tons per acre but now it has come down to $\frac{3}{4}$ ton.

Cultivation is carried on in these lands ordinarily for two years and sometimes up to four years. The lands are then left fallow for one year, when they are called palanilams. In the case of palanilams, ploughing is done in Vrischikam. The bunds are then breached so that the silt may cover up the fields. In Chingam the bunds will again be repaired and completed by Vrischikam, when the water will be pumped out. Particular attention is paid to the construction of bunds so that water from the backwaters may not get into the fields. With the first showers in Karkaḍakam, another ploughing is done in low water. The water is then pumped out and sprouting seeds sown between the middle of December and the middle of January. Four or five days after the sowing, the water is completely baled out making the field as dry as possible. After two weeks water is allowed to get in so that the weeds which must have sprouted during that period are destroyed. Transplantation begins a month later. The regular weeding and filling up of the gaps are done at this time. Aeration is then given and the water is again baled out to facilitate tilling. The fields are kept

dry, completely dry for four days. Water is then let in to a height of six inches from the ground and kept on till the plant flowers. By that time the water disappears through evaporation. Irrigation ends now. The crop becomes ready for harvest in 90-100 days and is harvested in March-April.

Harvesting in all the fields must be done simultaneously before the south west monsoon sets in. So much so harvesting is completely dependent on outside labour as local labour is insufficient. Consequently there is a regular migration of labour to the punja tracts in harvest time. The processes of reaping, threshing, drying, winnowing and storing are the same as those described above.

The varieties of paddy cultivated in Kuṭṭanād are given in the table on the next page.

List of important varieties of paddy cultivated in Kuttanad.

No.	Name.	Place where cultivated	Seed rate per acre in parās	Sown or transplanted	Duration	Season	Remarks.
1	Chāma	Purakkād	10 parās	Both	95 days	Kumbham	
2	Pokāli	Do.	Do.	Do.	100 "	Do.	
3	Kodungallūr Kuruva	Do.	Do.	Do.	95 "	Do.	
4	Uppu Kuruva	Thottappally	Do.	Do.	90 "	Both seasons	Salt resistant
5	Keochuvithu	Do.	Do.	Sown	80 "	Do.	
6	Karuṭhachāra	Do.	Do.	Both	100 "	Kumbham	
7	Vejjamyla	Thalavady	Do.	Do.	85 "	Minam	Grows well in alluvium
8	Karuṭhamyla	Do.	Do.	Do.	Do.	Do.	Do.
9	Chennel	Do.	5 parās	Sown	6 months	Kanni	Do.
10	Veupel	Edathuva	10 Do.	Do.	120 days	Minam	Do.
11	Kaṭiveñnel	Do.	10 Do.	Do.	Do.	Mēdam	
12	Padansvejjā	Kōlimukku	10 Do.	Do.	80 days	Do.	Do.
13	Navara	Nedumudi	10 Do.	Do.	70-75 days	Do.	
14	Karuṭhachuṭṭiyaran	Thakaḷi	Do.	Do.	95 days	Kanni-Mēdam	
15	Muthakkolappāla						
16	Anakkoṭan	Kaṭumādi	Do.	Do.	70-75 days	Both seasons	Mainly grown in Karappādams.
17	Chemṃūkkan	Do.	Do.	Do.	80-85 "	Do.	
18	Jirāka kuruva	Do.	Do.	Both	Do.	Do.	
19	Thuṇippāvu	Paṇipādu	Do.	Sown	100 "	Do.	
20	Cheruṇvirippu	Do.	Do.	Do.	80 "	Do.	
					90 "	Mēdam	

Large areas of kārī or peaty marsh soils occur in different parts of Travancore, about 10,000 acres in and around Porakkād in Ampalapūḷa taluk, Kārī lands. 10,000 acres at Chempil, Vecchūr and Kumārakam in Vaikom and Kōṭṭayam taluks, 5,000 acres in Thuravūr in Shērṭhala and about 5,000 acres at Pallikkara in Kunnathunād, comprising altogether an area of about 30,000 acres. These are swampy areas with black and very loose peaty soil. The sub-soil consists of partially decomposed organic matter. Logs of wood of different species are often seen below the sub-soil. These marshes are overgrown with weeds peculiar to the locality and the minimum depth of water in them will be about $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. in the driest part of the year. There is no good flow of water to and from this land and the water stagnates in all these blocks. The blocks are situated along the sea coast except the one in Kunnathunād, which lies about ten miles to the interior. On account of pressure to get sufficient lands for cultivation, all these blocks have been taken up for reclamation during the last twenty years. The first step in their cultivation is to remove the weeds. The soil is then stirred by the plough or spade in three feet of water and bunds are put up in tact on all sides. The water is then pumped out and the seeds are sown by the end of December or early in January. The crop is harvested in March. The period of growth ranges from 90 to 100 days.

The cultivation begins after the north east monsoon has spent itself and the harvest takes place before the south west monsoon breaks out. If the north east monsoon ends late and the south west monsoon starts early before the crop is harvested, the cultivators lose heavily. As regards the growth of crops, there are some peculiarities with these lands. Paddy grows very luxuriantly for the first one month or so. If it rains at this stage, the whole crop begins to wilt. This occurs in small patches. The leaves become yellow in these patches and the plants wither and

die. In the first harvest after reclamation the yield is about $\frac{3}{4}$ of a ton per acre but it decreases year by year. The land is being limed and treated with ammonium phosphate and superphosphate ($\frac{1}{2}$ cwt. each per acre) or Niciphos (1 cwt. per acre) on the advice of the Agricultural Department. The results are encouraging.

DRY CROPS.

Paddy. Mulankrishi.—The method of cultivation with details thereof is thus described by Mr. T. F. Bourdillon.*

“As soon as the rains have ceased and the dry weather has regularly set in, the “Virippukāran”, as the Hill-cultivator is called, proceeds to some unoccupied part of the country, and selects a piece of waste land sufficient for his wants; if he is a poor man he contents himself with a few acres, enough to supply him and his family with grain for a year, but if he is wealthy he selects a much larger piece, purely as a matter of speculation, for he knows he can always find a sale for the grain. If he can find a piece of virgin forest which has never been cleared before, he chooses that, knowing that the field will be much greater there than where the forest has been cleared, and the ground cropped before. Failing this, he contents himself with land covered with secondary forest, which has grown up after cultivation was abandoned, and the longer the land has lain fallow the better will be the return, anything under 10 years fallow being considered useless. Having decided on the scene of his operations the “Virippukāran” proceeds to cut down the undergrowth, trees, and grass growing on his piece of land. If the timber is very heavy the larger trees are sometimes left standing, but in this case, they are usually girdled, so that they may be killed, and there may not be any drip from the branches and leaves on to the ground below them. When the trees, etc. have all been

* See the Report on the Forests of Travancore.

felled, they are allowed to lie for 2 or 3 months until they are thoroughly dried, and then they are burnt, and as soon as the ground has cooled after the fire, the ashes are dug into it, and a fence is usually erected round the clearing to keep out wild animals. The land is now ready for sowing, but the grain must not be sown until the first showers of the monsoon have fallen and moistened the ground. Three months after sowing, the paddy begins to ripen and is reaped. The land is usually abandoned and left fallow for 10 to 20 years, until the shrubs and trees on it have attained a good size. In some cases after the crop has been reaped, the land is cleared again and sown with horse gram or some leguminous seed. After this second crop has been gathered, the land is again cleared up and another crop of paddy is taken of it. Curiously enough, this second crop of paddy is, I am told, often much finer than the first crop. In some places, and chiefly on the eastern side of the hill-plateaux, *ragi* (*Eleusine coracana*) is sown instead of rice, the reason being that in these localities there is a great deal of mist which causes the paddy to mildew, but *ragi* does not suffer in the same way. In South Travancore tapioca and various kinds of millet are also grown, but though the products raised are not the same in all cases, the system of hill-cultivation is identical everywhere. Throughout Travancore the regular season for clearing is from December to June, when the seed is sown, and the crop ripens about September."

Originally bare fallow ranging between six to ten years was fallowed; but now the pressure of population has affected changes in this form of cultivation. The lands are now cultivated almost yearly. Hill paddy is cultivated in high levels in the taluks of Paṭhanamthiṭṭa, Paṭhanāpuṛam, Neḍumangād, Chirayinkīl, etc. It is a rotational crop. The yield and cost of cultivation are very low compared with those of other crops. Hill paddy is also raised in teak

plantations when the same are let out on taunga system by the Forest Department.

The following is a list of the important varieties of hill paddy:—

Iḷanel	Kompanaṛyan
Irkuvella	Pūkkulakkuruva
Vanguvella	Kaṛiminchān
Nanjanamūppan	Kaḷacchampa
Karuppukachuṇappu	Piṇikkuruva
Channavella	Pannimūṭan
Darpakkuruva	Pannikkuttalan (white, red and black)
Varaviḷanthān	Ponkayan (white, red and black)
Pūvāḷankuruva	Kaṭṭivella
Kaṭṭikkuruva	Karuthelaviṭṭu
Ānamonthan	Ottamūṭan
Chelivāṇi	Kaithalkuruva
Ponamkuruva	Chenkuruva
Chava Hanikompan	Kaṛavayalviṭṭu
Kitamūṭan	Pāṇḍivella
Munṭuvella	Ponnarapavila
Inchakkāḍan	Ikichennavella
Kāmadēvanvella	Muriyan Ramathi.
Ottakkali	

At present only about two-thirds of our domestic requirements are met by local production, the remaining one-third being annually imported from outside, mainly Burma.

The Legislative Council and the Economic Development Board have repeatedly passed resolutions urging that ways should be sought and means devised to increase the production of rice in the State. With this end in view, the Agricultural Department is undertaking work on the following lines:—

1. The evolution of new strains of paddy which yield better, mature earlier and resist the effect of alkalies, salts and diseases more successfully.

2. The introduction and acclimatisation of high yielding exotic varieties of paddy.

3. The eradication of Veppin Passiura and other weeds which now interfere seriously with the successful cultivation of paddy in Nānjanād.

4. The reclamation of alkali soils in Nānjanād.

5. The initiation of a series of manurial experiments.

Good work is being done in the experimental paddy farm at Thiruppathisāram. The farm was opened in 1914 in an abandoned tank-bed the soil of which was heavy clay containing a large proportion of alkali salts. The chief objects of the farm are:—

1. Improvement of paddy seed by selection and distribution of improved seeds among the ryots.

2. Reduction in seed rate for broadcast, sowing and transplantation.

3. Trial and introduction of exotic varieties of paddy having high cropping capacity, fine quality and short duration.

4. Conducting manurial experiments.

5. Reclamation of alkaline soils.

6. Combating pests of paddy crops like the paddy stem borer.

The farm has conducted experiments in seed selection, seed rate, spacing, and age of seedlings. It has tried exotic varieties of paddy. The varieties that have been successfully tried are given in the following table:—

No.	Variety	Season	Duration	Yield in lbs. per acre	Remarks.
1	T. B. E. No. 1	Edavam to Thulam	140 days.	3,000-4,000 lbs.	An alkali resistant; strain evolved by selection from an exotic variety to suit the conditions obtaining in Nanjanad; can be cultivated in places with unimpeded water supply.
2	Viryatankan	Do.	135 "	2,500-3,000 lbs.	Selection from the local.
3	Sampa	Do.	120 "	2,000-2,500 lbs.	Selection from the local.
4	Pokali	Do.	130 "	2,500-3,000 lbs.	Introduced from North Travancore for water-logged areas.
5	T. E. B. No. 3	Do.	130 "	2,500-3,000 lbs.	Selection from Thekkenchira. Exotic, Malabar.
6	T. E. B. No. 2	Kanni to Kumbham	160 "	2,835-4,909 lbs.	Selection from local Cherumary.
7	Kallansampa	Do.	180 "	3,000 lbs.	Selection from local Kallansampa.
8	Thattaravella	Do.	Do.	Do.	Do. Thattaravella.
9	Jamboli	Do.	187 "	2,035-3,000 lbs.	Introduced some fifteen years ago by the late Mr. Ananthanarayana Aiyar, Land Revenue Commissioner.
10	Suriyakanthi	Do.	120 "	2,000-2,250 lbs.	Exotic. Introduced long ago before Jamboli.
11	Chadayati	Do.	Do.	Do.	An exotic variety introduced in 1103.
12	Whiteputt	Do.	Do.	...	Experiments to acclimatise this fruit are in progress. This variety is in great demand for making several preparations and is considered to be a delicacy.
13	Koalkka Doderi	...	...	...	Exotic from South Canara. Yield was disappointing, hence discontinued.

No.	Variety	Season	Duration	Yield in lbs. per acre	Remarks.
14	Paranibu Vattan	Kanni to Kumbham	120 days	2,000-2,250 lbs.	Exotic from Malabar. Discontinued due to poor yield.
15	Kocchuvelia	...	...	...	Discontinued due to poor yield.
16	O'munjan	...	...	...	Weal but the grains shed off at maturity. Hence discontinued.
17	Cigar paddy	...	...	...	Exotic. Did not get acclimatised. Has to be tried again.
18	Cluster paddy	...	...	...	Exotic. Yield poor, so discontinued. (Good for hybridisation).
19	Blackputt	...	...	...	Did not get acclimatised.
20	Himiayatsagar, 504;	Kanni	4 months	Below 2,000 lbs.	Did not acclimatise in Nānjanād though it thrives well at Puliyara.
21	Alwaye éampa	...	...	...	Poor yield, so discontinued.
22	Navara	...	...	...	Introduced from Central Travancore; yield poor and discontinued.
23	Claval	...	...	...	Introduced from Central Travancore; yield poor and discontinued.
24	Ethumpu	Edavam to Kumbham	...	...	A variety of deep water paddy from Central Travancore; under trial.
25	Digha	Do.	...	...	Exotic from Orissa. A deep water variety of paddy. Under trial.
26	Latta	Do.	...	...	Do. Do. Do.
27	Jayna	Do.	...	...	Exotic from Crissa. A deep water variety of paddy; under trial.
28	Sachi	Do.	...	...	Do. Do. Do.
29	Bajal	Do.	...	...	Do. Do. Do.

No.	Variety	Season	Duration	Yield in lbs. per acre	Remarks.
30	Aruvāthamvellā	Both the seasons	80-90 days	1,700-1,800 lbs.	Selection from local variety, for channel tailends.
31	Aruvāthamkuruvā	Do.	Do.	Do.	Do.
32	Kochuvellā selection	Do.	Do.	Do.	Do.
33	Pusa 94.	Kanni	4 months	Below half fold, i. e., less than 2,000 lbs.	Do.
34	G. E. B. No. 24	Kumbham	4 months	Do.	...
35	Co. No. 2	Do.	Do.	Do.	Exotic.
36	Manavari	Kanni	Do.	Do.	Do. from Coimbatore.
37	Pavam Kuruvā	Do.	Do.	1,736 lbs.	Discontinued due to poor yield.
38	Chinkanni	Do.	Do.	1,336 "	Do.
39	Māppillā Sampa	Do.	Do.	973 "	Do.
40	Paluthi parāthy	Do.	Do.	1,768 "	Do.
41	Chiliakkali	Do.	Do.	1,317 "	Do.
42	Thūyamally	Do.	Do.	612 "	Do.
43	Valāīramunṭan	Kumbham crop	6 months	1,714 "	Do.
				2,500 "	A selection from the local Valāīramunṭan.

The Agricultural Department has conducted several manurial experiments. In view of the present phenomenal fall in the price of paddy, an experiment was started to ascertain the economic results of rotating a commercial crop like sugarcane with paddy. It is believed that the cultivation of sugarcane on a large scale every alternate year in paddy lands where irrigation facilities are ample ought to be profitable. Experiments in alkali reclamation is another item of work done by the department. As a result of repeated selections of paddy, a strain which possesses the specific quality of alkali resistance has been evolved. It has also been found that weeding out the affected seedlings before transplanting is the only practical method of checking the stem borer pest. The application of copper sulphate in fixed doses is seen to kill the weed called Veppin Pasy. The influence of the Thiruppathisāram paddy farm on agriculture in South Travancore has been great. But conditions in the paddy fields of the central and northern divisions are entirely different from those obtaining in Nānjanād. The Agricultural Department is taking steps to improve agriculture in those parts as well.

Paddy in Kuṭṭanād is every year seriously damaged by the Rice Swarming Caterpillar, which leads to the loss of paddy worth several lakhs of rupees. The Entomologist of the Agricultural Department has suggested kerosening the water in the field when the larvae are very young, by adding six to eight pints of kerosene oil per acre and then dragging a heavy bamboo pole over the crop.

The fall in the price of paddy makes its cultivation unremunerative to the producer. The Agricultural Department is pursuing its work in the belief that the production of paddy may be made remunerative even at present prices if only labour-saving implements are used on a large scale, improved seeds are distributed extensively in an organised scale through seed unions and co-operative societies, and vigorous propaganda is started to educate the ryots. Large

farming and consolidation of small holdings, efficient drainage and preventing or minimising erosion and silting up of paddy fields engage the attention of the department.

Chōlam. Chōlam, especially the white variety, is grown in the southern taluks adjoining Tinnevely and in

Shenkōṭṭa on the field scale. Black soil
Other Cereals.

containing lime is the best suited for its cultivation. The ground is prepared about Mēḍam (April-May) after ploughing several times and penning sheep for three or four days or otherwise manuring. The sowing takes place about Eḍavam, (May-June). The crop is dependent on rain, but a light rainfall is enough. It becomes mature in four months. The stalks are cut low; the ears are removed and the grain, after thrashing, is separated from the chaff by winnowing. The straw is a favourite and nutritious food for cattle. Under suitable irrigation, ploughing and manuring, several crops can be obtained from the roots of the same plant. This requires comparatively little care.

Rāgi, Chāma, and Thena are grown in dry lands and also in compounds and open spaces between trees. Kampu, Kumpam Pullu or Kūvaṛaku is grown in the southern taluks, though on a small scale, and Vaṛaku to a small extent on the Cardamom Hills. Maize is not common but is occasionally found in the parts adjoining Tinnevely.

Pulses. Of these only cow pea, vaṭakkanpayar, black gram, horse gram and green gram are described here, as they are the only largely cultivated pulses in Travancore. Black gram and green gram grow luxuriantly in soils containing lime, in the outlying taluks of Shenkōṭṭa, Thōvāḷa and Agasthīśwaram. They come up well in Neyyāttinkara and other parts of the southern division also. In small quantities they are cultivated in all parts of the State. There are two varieties of black gram, namely, eṛuma uḷunnu and cheru uḷunnu. Of these the former type takes more time to grow. It is sown about the middle of

Edavam (May-June). A crop may be had only once a year and that during the dry season. In South Travancore this crop is grown in paddy lands as a catch-crop, as gingelly is grown in Central and North Travancore. Two crops of the black gram and green gram are raised during the monsoon periods. The south west monsoon cultivation takes a longer time for harvest than the other. It is sown in Minam and harvested in Mithunam. The north east monsoon crop is sown in Thulām and harvested in Dhanu.

The mode of cultivation is the same for all kinds of grams. The ground is first ploughed, made even and then divided into small plots. The soil is ploughed again and hand-hoed. Ash is the usual manure and it is applied before sowing. The seed is then sown, five or six edangalis on an average for one acre of land. The ground is ploughed again a third time. In the selection of seeds care should be taken that they keep their proper colour, that their sprouting portions stand prominent and that they are not damaged. Grains smaller in size than the average ones are considered bad seeds. Black gram and green gram generally grow to a height of one and a half to two feet.

Horse gram is cultivated in open places on the hill-tops and as a catch-crop in newly opened plantations on the hill-slopes. It comes up well even in poor soils. The sowing season is in Kanui, (September-October) and the harvest is reaped in Makaram (January-February). There is only one crop in the year. Cattle manure is used instead of ash in the case of horse gram. The plant does not rise very high from the ground. There are two varieties of horse gram—the brown and the black. The former variety is preferred to the latter.

The plants of all these pulses except cow pea are plucked root and branch when the pods have all become ripe. They are then dried and beaten and the seeds separated. The cost of cultivation is very much the same for all classes of grams. Roughly it comes to about rupees eight to ten per acre.

The following are some of the varieties of cow pea:--

1. Perumpayar or Kolinjippayar
2. Kaṛingaṇṭa
3. Iṭinchakaṇṇi
4. Pulamunṭan
5. Vaṭakkanpayar
6. Sixteen-seeded payar
7. Chenthanṭan
8. Neḍumpayar.

Kolinji, vaṭakkanpayar, sixteen-seeded payar and chenthanṭan are peculiar to Travancore.

Dhall (Thuvaṛa) is also cultivated in Travancore, though not largely. The local pulse known as malanthuvaṛa provides big seeds which do not easily boil. It has a tendency to become a perennial shrub instead of an annual as on the other coast. It grows well in places near Varkala and there is a large demand for this gram as is evidenced by the figures of import, viz., 66,915 cwts. to the value of B. Rs. 3,82,406. There is every scope for developing this as a regular crop.

Rats, squirrels and birds do great damage to the crops. There are other pests besides. The Entomologist has identified more than eighteen varieties of them, the more important of them being the Munja and the Neḍumpuḷu. They can be destroyed by sprinkling ashes on the plants when the pests attack them.

Edible roots occupy a prominent place among the garden products. The most important of these root crops

are the tapioca or cassava. Elephant
 Edible roots. foot, yam, chēmpu, kācchil, sweet potato, chivakkilangu, cheruvallykkilangu, arrowroot, mukkilangu, kaṇaṇṇa and taplipot palm are other important root crops.

Cassava is a native of North America. Fifty or sixty years ago, the poorer classes of people in Travancore began to eat the root and within a few years its value as a

food became widely known. Now it forms the chief food of the poorer classes and is also consumed by the middle and even the higher classes of people, so much so that it may be called the potato of Travancore. There are seventeen varieties of tapioca which are cultivated in the State. Of these, ten are known by the general name of maravan or dark-coloured varieties. The remaining seven are known as avians. The avians yield their crops in a shorter time. The most popular maravan varieties are :—

Ānamaravan

Thuruva

Kaṛumaravan

Chemkampan.

The following are some of the types of the aviyan variety :—

Kōvilvellā

Malavellā

Neḍu Vellā

Piṛian Chuvala.

Kokkian Vellā

Karūtha aviyan

When raw all these are more or less bitter on account of the presence of the cynogenetic glucoside which on hydrolysis gives rise to hydrocyanic acids. The poisonous principle is removed by boiling. The aviyan varieties are less bitter and their poison is removed by a single boiling, while the others require boiling three or four times to get rid of the poison.

Next to rice, tapioca forms the chief food crop of the country. The poorer classes live almost entirely upon it. More than 4,42,753 acres of the cultivated area of the State are under this crop. There are still several thousand acres suitable for its cultivation and, as demand increases, more and more land is being brought under it. It thrives best in rich light soil. Most of the lands under tapioca are in what is known as the submontane region, the belt of land lying between the littoral tract and the hills and consisting of level flats, small elevations and depressions.

The plant is propagated by planting portions of the stem cut into convenient pieces four to eight inches long.

They are planted in rows three feet distant from one another. Planting can be done throughout the year, but the best time is in the beginning of the rainy months. In hot weather the plants should be watered during the first month, after which it will grow without irrigation on account of its hardiness and drought-resisting capacity. The plants have to be protected from weeds. Tapioca is an exhausting crop and requires heavy manuring. Organic manure and wood ash are the most common. Tapioca is generally cultivated with other crops such as pulses and cereals in rotation. The duration of the crop varies from six to twelve months, the period depending mostly on the variety grown and the soil. The yield varies considerably in different localities. The average crop still yields two to five tons of roots per acre. Experiments conducted by the Department of Agriculture have proved that the yield can be doubled or even trebled by improved methods and judicious manuring. Tapioca is used as food in various ways. The roots are boiled in water and eaten like potato or made into curry. They are also cut into chips and dried. The dried chips may be fried in butter or oil and eaten. Tapioca flour is a good substitute for sago and is largely used in making puddings and biscuits. Tapioca gruel given to cows increases the quantity of milk. In regard to its value as human food, tapioca compares favourably with the other root crops. There is still scope for extending the cultivation of tapioca.

Kācchil (Yam)--(*Dioscorea alata*). This is a climber with quadrangular stem. The leaves are sharply angled. It is a common garden crop all over Travancore. Its tubers are large and more or less cylindrical in form. An average good tuber is about $1\frac{1}{2}$ ft. long, and 9 in. thick. The plant seldom flowers. There are several cultivated varieties, differing in colour, taste and size. *Kācchil* is either propagated by aerial tubers or by small underground tubers or portions of large underground tubers. Generally setts from underground tubers alone are used. The soil best suited for the crop is a

deep, friable, sandy loam with good drainage. Stiff clay soils are unsuitable. The land is dug to a depth of about 2 ft. and well manured. It is then lined, the lines being 3 ft. to 4 ft. apart, and the setts are planted on ridges $1\frac{1}{2}$ in. to 2 ft. apart in June and July. A stake, 8 ft. to 15 ft. high, is planted in each pit for the plants to trail round and climb. The setts are sometimes planted near trees, so that the plants may climb on them. After planting, occasional weeding and earthing up are necessary. The crop is ready for harvest in November. The yield depends upon the soil, the climate, the method of cultivation and manuring. Under favourable conditions seven to ten tons of tubers are obtained from one acre.

Kāechil is a rich, starchy food-stuff. It is cut up into small pieces, boiled and eaten in the same way as potatoes. A clean white flour can be prepared from it. This contains a fairly high percentage of proteids. It is very much relished.

Chāmpu (Colocasia antiquorum):— Chāmpu is a tuberous herb commonly found in all tropical countries. It has a short, farinaceous underground stem or corm. From the corm arises a number of leaf stalks, bearing large heart-shaped leaves. Both the corm and the aerial parts are cooked and eaten. There are several varieties of chāmpu differing in size, colour and taste. All of them are cultivated extensively throughout Travancore.

The soil best suited for chāmpu is sandy loam. The plant has a great partiality for bulky organic manures like cattle dung and green leaves. If these are applied along with wood ash, a high yield is obtained. Propagation is effected by planting small corms. They are planted twelve inches apart on beds. Chāmpu does not strike its roots deep and therefore requires heavy manuring and copious irrigation. The yield varies with the soil conditions. Two or three tons per acre is the average

out-turn at present, but it can be increased considerably by a more efficient system of cultivation.

The corms which contain a high percentage of starch are boiled and eaten like potato. The flour prepared out of the corms is of good quality and can be largely employed for making biscuits and other preparations. The leaves and stalks are used for cooking like other vegetables. All parts of the plant have an acrid taste due to the presence of oxalate of lime, which can be removed by boiling in water or by treating it with tamarind. There are several cultivated varieties of this tuber.

Ch'nai.—This is a tuberous herb found both in wild and cultivated forms. The tuber is very nutritious and on that account is cultivated extensively as a food crop.

Like other tuberous crops, this is also propagated by planting pieces of underground stem or corm. The corm is generally cut into three to five pieces which are dipped in cattle dung mixed with water and dried. The land selected for planting is well dug up, and square or circular pits 1 ft. to 1½ ft. deep and 2 ft. in diameter or 2 ft. square are made at distances of about 2 ft. to 2½ ft. The pits are manured with a mixture of dried cattle dung and wood ash, and one sett is planted in each pit. After planting, the whole plot is covered with a thick layer of leaves. This will conserve moisture and add to the fertility of the soil when the leaves get decomposed. Planting is done in April and May and the crop is ready for harvest in the following November and December. When cultivated under suitable conditions, each tuber will weigh 15 lbs. to 25 lbs. The average yield per acre is six to eight tons.

The tuber cannot be eaten raw because of the presence of an acrid, caustic principle. When boiled or made into curries, it becomes a very good dish. It abounds in starch and is sometimes applied as an external stimulant for boils and ophthalmia. Besides its food value it has also stimulant and expectorant properties.

Sweet potato, cherukilangu, Nanakilangu, cheruvallykkilangu, chivakkilangu, mukkilangu, pidikilangu, Chanakilangu and arrowroot are some of the other root crops that are grown in the State. Of these the chini or sweet potato is the most widely cultivated. Chivakkilangu is grown chiefly in the northern taluks.

Sweet potato grows well in all lands where tapioca is cultivated. But generally wet lands with alluvium are used for raising this root. The field is divided into plots and beds are raised half a foot high and small pits are dug. Creepers are cut into bits one foot in length, with two or three nodes, and planted. Ashes and cow-dung mixed with earth form the chief manure. Planting takes place generally in May during the prevalence of the south west monsoon. If there be no rain, the plants require watering once a week and sometimes oftener. The tendrils require occasional pruning. As the tubers become mature, the leaves and stems become yellow. The plant thrives well in the rainy season and yields its crop in four months. The yield from a pit varies from one to four pounds and an acre of ground can hold more than 4,000 pits.

The tuber is about four or five inches long and about two inches round. It is sweet, palatable and nutritious. The herbage is employed for feeding cattle. There are two chief varieties, one with white tubers and the other with red ones. The former is better appreciated for its taste.

Arrowroot. This grows almost wild and in great abundance. A farinaceous substance is procured from the roots. The flour when finally powdered and boiled in milk is an excellent diet for invalids and children and can be used for cakes, puddings, etc.

Gingelly (Sesumum indicum)—Gingelly is an annual plant growing to a height of two to three feet. It is cultivated all over the tropics for the oil which is extracted from its seeds. It appears to

Oil seeds and oils.

have been common in India long before the Āryan immigration. Crops of gingelly are raised in all parts of the State. There are two varieties, one whitish and the other black. The latter is the more common of the two and is known as first sort gingelly because it yields the largest percentage of oil, viz., 43 per cent. The soil best suited for the cultivation of gingelly is well-drained alluvial loam. The land is ploughed and harrowed and the seed sown at the rate of eight to ten pounds per acre. The average yield per acre varies from 330 to 450 lbs. The area cultivated with gingelly in Travancore is in no way commensurate with the needs of the people. The oil varies in colour from pale yellow to dark amber. In India it is largely used for culinary purposes, in anointing the body, in soap manufacture, occasionally as an illuminant, and sometimes in adulterating ghee. In some countries it is used chiefly in making soap. In many of its properties it resembles the olive oil. The oil from the black variety of gingelly is generally believed to be better suited for medicinal purposes than that of the white. It is also extensively used in the manufacture of perfumes. The oil-cake left after expression of the oil is in demand all over India as a cattle food, and in times of famine it is also eaten by the poorer classes of the people.

Ground nut—This is not a very popular crop in the State. It flourishes well in sandy loam and loamy soils. The field should be ploughed deep thrice and clods crushed before sowing. The land should then be heavily manured with ash. Great care is necessary in the selection and preservation of seeds.

Sowing takes place just before the commencement of the south west monsoon. If there is sufficient facility for irrigation, there is no harm in sowing a little later. Sowing is done by dropping the seeds at a distance of five or six inches from one another in furrows made by the plough. The seeds sown should be covered with earth by using a

leveller. Weeding should be done twice or thrice during the growth of the plant. River and tank silts, lime and ashes form good manure. Sheep may advantageously be penned on the land before sowing.

Five or six months after sowing the crop can be harvested. Harvesting is done by ploughing up the field or by deep spading. After harvesting the stem and the leaves are used as fodder for cattle.

Ground nut is mainly used as an oil seed. The oil is used for lighting purposes. It commands a good market in the Madras Presidency and elsewhere. Ground nut can be grown in Ōṇāṭṭukara, Chengannūr, Thiruvalla and in all places where bananas can be successfully cultivated.

Punna (Alexandrian laurel)— This is an evergreen indigenous tree. It grows to a height of about fifty feet. Its leaves are elliptical, obtuse or retuse. The flowers have an agreeable odour; the fruits are one-celled, one-seeded, oval or round. The size of the fruit varies according to the variety, but its colour when ripe is always greenish yellow. When the seed is mature, the pulp surrounding the seed dries up, the skin becoming brown or black and much wrinkled. The seed is nearly of the same shape as the nut. It is oily and has a rancid taste. In some parts of Travancore the leaves are used as manure. The bark when wounded gives out a green resin, which has not been made use of in any way. The green leaves steeped in water form a useful application to sore eyes. The bark is powdered and applied to swellings. The oil which has a disagreeable odour is extensively used as an illuminant. Its properties need further investigation. The price of the oil is about two annas per pound. The oil cake is used as fuel. It has been recently found to be an excellent manure for rice, and consequently its price has gone up. Most of it is now used in the State.

Cherupunna (Calophyllum wightianum)—This is another species of *Calophyllum*. It grows in great abundance

in North Travancore, especially in the coastal region. A thick oil is extracted from the seeds of this tree. It does not differ much in properties and uses from the punna oil. The wood is hard and is used in making furniture and in the construction of buildings. It is also suitable for making match boxes.

Iluppa. (*Bassia longifolia*):—This tree, which thrives best on deep, light soils grows to a height of about forty feet. The leaves are ovate, lanceolate, and entire. The flowers are whitish and the fruits oval shaped. When ripe, the fruits are yellowish in colour and contain eight to nine seeds. The tree is rich in a gummy juice, which exudes from the bark. The season for obtaining the seeds is from August to November. Oil is extracted from the seed. The dried decorticated seed contains about sixty per cent. of oil. The oil fetches a good price, its value compared with that of coconut oil being in the proportion of six to eleven. It has a yellowish tint with a slightly disagreeable odour. It is sometimes used as a substitute for ghee and coconut oil and also as an illuminant. The cake which is left over after the oil has been expressed is used as a substitute for soap. The wood is hard and difficult to work with.

Maraveppi. (*Hydnocarpus wightiana*):—This tree is found largely in Central and North Travancore. It grows to a height of about 50 feet. The leaves are glabrous, serrated and alternate. The tree bears once a year, the season lasting from February to April. The fruit is globose and very hard. It is of the size of the apple and contains numerous seeds. The seed yields about forty per cent. of oil, which is very much valued on account of its medicinal properties. It is clear, slightly yellow in colour and thicker than calophyllum oil. It is preferred to the latter as an illuminant, because it burns more steadily. On standing it gradually thickens, finally attaining a butter-like consistency. The thick fat sells at a slightly high price. The oil is in much repute as a remedy for leprosy. It has the

colour and odour of chaulmugra oil. When treated with sulphuric acid, the oil gives gynocardic acid reaction but in a less degree than the real chaulmugra.

Oḍal: (*Sarcostigna Klenii*)—*Oḍal* is a climbing shrub commonly met with in several parts of Travancore. The leaves are alternate and short-petioled. The flowers have no pedicels, but form numerous sessile fascicles. The fruit is about one inch long and half an inch broad, and in the form of an oval, somewhat flattened nut. A valuable oil is extracted from the kernel inside the seed. This oil is extensively used as a medicine for rheumatism, itch, leprosy and piles. In places where large quantities are available, it is also used as an illuminant.

Kaṛinjṇṭṭa (*Samadera indica*)—This is a tree, 25 to 30 ft. high, with very long, oblong, elliptical, alternate leaves. The flowers are yellowish-white in colour. The tree grows in great abundance in Travancore, Cochin and British Malabar. Every part of it has a bitter taste. The seeds yield an oil largely used as a cure for rheumatism. The oil is very bitter and yellow in colour and contains 84 per cent. of olein and 16 per cent. of stearin and palmitin. The bitterness of the oil is attributed to the presence of samaderin, a yellow, amorphous substance easily soluble in water and alcohol. Like many other vegetable oils, this is also used as an illuminant.

Pūvam and Pungu—These two trees yield oils which are mainly used as illuminants by the poor class of people.

Margosa (*Neem*)-*Azadirachta indica*—This tree grows wild. The leaves are simply pinnate, and the leaflets, nine to fifteen, are ovate, lanceolate, serrated and very bitter. The fruit when ripe is purple, one-celled and one-seeded. Within the fruit there is a thin, hard wood shell which encloses an oily, bitter kernel. A pale yellow oil with a bitter taste and powerful odour is extracted from the dried kernel. From very ancient times, the different parts and products of the tree have been used in Hindu medicine. Dr. White of

Bombay has recommended the bark as a febrifuge. Dr. Hove (1787) says: "From recent experience detailed in the Pharmacopoeia of India it would appear that the opinion of the natives of India regarding the medicinal properties of the different parts of this tree is substantially correct." The bark is a tonic and astringent. The leaves are added to poultices for glandular tumours. They are also beaten into pulp and applied to pustular eruptions, especially in cases of small-pox. The juice is administered internally for a variety of diseases, such as jaundice, boils, etc. The fruit is said to be a purgative and emollient. The oil expressed from the seeds is applied to suppurating, scrofulous glands and is used in the treatment of leprosy, rheumatism and several other diseases. It is a good remedy in dog maladies. It is soluble in ether, chloroform, carbon-bisulphide and benzol. After repeated agitations with alcohol, the ollaceous odour and bitterness disappear. The soap which is prepared from this oil is considered good for cutaneous diseases.

There are numerous fibre yielding plants in Travancore. Muramkiri, Screwpine, Attuparuthi, Kaiyoon and

Kuruparuthy are all fibre yielding plants which indigenous art makes use of. Fibre is manufactured out of leaves, stems and branches, roots, and fruits of several plants. It is extracted from both monocotyledonous and dicotyledonous plants. The cultivation of plants for their fibres is almost unknown to most of the Travancore cultivators. The following are the fibre plants grown in the State:—

MONOCOTYLEDONOUS.

1. *Screwpine*—This grows abundantly on the banks of salt water canals, backwaters, channels, etc. It thrives in most parts of the State. Its leaf is called thāḷa. Mats,

baskets, bags, etc., are made out of this thāḷa. The place famous for the manufacture of these articles is Thāḷava in Kaṛunāgappally taluk in Central Travancore. The roots are useful for making brushes.

2. *Chūṇṭappana* (Olaṭṭippana). This tree is grown in plenty in some parts of North Travancore. It got its name from the practice of using the fibre taken from its leaf-stem for angling purposes. Some kind of toddy also is tapped from this tree. Fibre is made out of its leaves, leaf-stalk, leaf-stem, flower-stalk, etc. Many kinds of brush are made out of this.

3. *Kaṛimpana*. This abounds in South Travancore and Shenkōṭṭa. Its fruit, leaf-stem and stem yield fibre.

4. *Coconut*. This is described in detail elsewhere.

5. *Plantain*. The cultivation of plantain is described in Chapter III, Vol. I. Its fibre is silky in texture. The Vāḷanār paṭṭu is made out of its fibre.

DICOTYLEDONOUS

Fibre is made out of the trunk or branches of the following dicotyledonous plants:—

- | | |
|------------------------|--------------------|
| 1. Ami. | 16. Kāṭṭupūvaraśu. |
| 2. Chorūṇa. | 17. Thonḍi. |
| 3. Neḍunāṛu. | 18. Muruthen. |
| 4. Chaṇam. | 19. Malamparūṭhy. |
| 5. Muḷḷakaṭhy. | 20. Valampiri. |
| 6. Athampavally. | 21. Pēlu. |
| 7. Palāśin chamatha | 22. Eṛukku. |
| 8. Paṭṭacchārāyamaṛam. | 23. Venḍa. |
| 9. Uthi. | 24. Chempārāṭhy. |
| 10. Koṭṭa. | 25. Kurunthōṭṭi. |
| 11. Unnam. | 26. Aṛayānjali. |
| 12. Ūram. | 27. Alam. |
| 13. Thuthi. | 28. Meṛuthy. |
| 14. Āttuparūṭhy. | 29. Ānakkattāḷa. |
| 15. Pavaṛaśu. | 30. Aloe. |

But no attempt is made to make fibre out of these on a commercial scale. The Agricultural Department has been trying to introduce and popularise the cultivation of varieties of cotton, sun hemp and agave.

Cotton—Cotton is not an indigenous crop in the State. Three varieties, viz., caravonica, Spence and Cambodia, have been tried by the Agricultural Department, with varying success. Cambodia appeared to be the most successful. It was found that the variety will grow well in lowlands not subject to inundations and also on the slopes of hills. The best time to start cultivation is during the north east monsoon.

Caravonica cotton is a perennial crop. There is therefore considerable difficulty in regulating the time of flowering. If the flowers come out during the rains, the bolls are easily damaged and the lint becomes useless. Caravonica cotton was tried in several parts of the State. It came up well at first but experience has taught that it is not suitable to the soil. Climatic conditions are also unfavourable to its growth except in Shenkōtta and South Travancore. Even in these places most of the lands suitable for cotton cultivation are under paddy and it may not be advisable to replace a food crop like paddy by a commercial crop like cotton.

Sun Hemp—This is an exotic valuable for its fibre. It was tried in the Trivandrum experimental farm, where it grew luxuriantly. Its fibre commands a good sale in European markets. Being a leguminous plant, it is good for green manuring purposes, and in the green stage it is also an excellent fodder for cattle.

Agave—This is found growing in a semi wild condition. It is cultivated on the hedges of compounds as a protection from the inroads of cattle, etc. In South Travancore the plant seems to have more or less established itself. The leaves which are broad and sufficiently long yield a strong, fine, white fibre. In some countries the fibre is used for

making ropes, hammocks, etc., but in Travancore it is put to little commercial use.

Tobacco and ganja grow in wild condition in some of the forests of Travancore. These are periodically destroyed by the subordinate officers of Government, under instructions, for fear that their existence would put a premium on illicit uses and smuggling. However, considerable attention has lately been focussed on the question of cultivating tobacco. In view of the profitable nature of the crop and the very large use made of tobacco in various forms by the people, the Agricultural Department are considering the feasibility of introducing the cultivation of tobacco in the State. A comprehensive set of rules has been passed by the Government regulating the cultivation of tobacco under licenses granted for the purpose. It is expected that the opportunities granted by the proposed rules will be largely availed of by the public.

Drugs and
narcotics.

Cardamom (Elettaria cardamomum)—Cardamom is a perennial herb indigenous to the south western coast of India. The plant has a thick, fleshy rhizome and grows to a height of 4 ft. to 8 ft. with long and much branched inflorescences arising near the ground. It grows in clumps varying from six to thirty stems according to the quality of the soil. The leaves are linear-lanceolate, with a dark green surface and a light velvety down on the underside placed alternately, embracing the stalks at their base. The leaves average fifteen to twenty on an old plant. The flower is very beautiful, white in colour with purple markings, which grow on long scraps thrown out from the bulbs along the ground. The fruit is enclosed in capsules which are green till the fruit ripens, when they turn into a dim clean colour. The capsules are divided into three cells with a double row of dark seeds in each cell surrounded by a sweet glutinous pulp. The seeds known in ancient times as 'grains of

Condiments
and spices.

paradise' have a strong aromatic flavour. They are used as a flavouring material in confectionery, liquors, curries, and for chewing. Cardamom has great medicinal properties and has a place in eastern and western pharmacopœia.

There are two distinct varieties, known as Malabar cardamom and Mysore cardamom. The former is the local indigenous variety. It is grown in the Ēlanala from very ancient times. The Mysore variety is a recent import, but the cultivators are showing an increased partiality to the latter, as it gives a better yield. Its fruit is round, while that of the Malabar variety is long. The Mysore variety yields for eight months, from Thulām to Eḍavam, while the Malabar variety yields only for four months, from Thulām to Makaṛam. The fruit stalk of the Mysore variety stands straight, while that of the other clings to the ground. The crop is found on the hillocks along Pirmēde. The chief requirements of successful cultivation are a fairly deep, rich loam soil and a site sheltered from strong winds and too much sunlight. The interior forests are therefore the best lands for cardamom cultivation.

Cardamom requires an annual rainfall of 80 to 100 inches, distributed throughout the period of cultivation. From Thulām to Dhanu the crop requires plenty of rain. If the crop does not get sufficient rain throughout this period, the yield is reduced considerably.

Preparation of the soil — Clearing the forests is the first step in the preparation. This is done in the months of Makaṛam and Kumbham. The pits should be 2 ft. square and 1 ft. deep. They should be 6 to 8 ft. apart. In 8 ft. spacing 700 pits may be made in one acre of land. Disafforestation, weeding and pit-digging must be over by the end of Mēḍam. The seeds have to sown in that month. Seedlings of the cardamom plant are raised in specially prepared nurseries either from seeds or from rhizomes. The plants raised from seeds are as a rule free from disease and this method is therefore practised to raise

seedlings. When the seedlings are a year old, they are ready for transplanting. They should then be transplanted 2 ft. apart. When the plant is two years old, it should again be transplanted at 4 ft. space. The seedlings should be planted only after they are three years old. Usually two plants are planted in one pit. Thus about 1,400 plants can be grown in an acre. Eḍavam and Mithunam are the best months for planting. The land is prepared by ploughing or digging. Holes 1 ft. deep and 1½ ft. wide are made and seedlings planted at the commencement of the south west monsoon. The distance from plant to plant varies from 6 ft. to 12 ft. according to the quality of the soil. The planted area is weeded regularly for the first three or four years. Sometimes, after planting, earth is heaped up round the clumps to encourage the growth of creeping racemes. The cardamom plant responds markedly to the application of rich, organic manures like leaf mould. It begins to bear fruit within three or four years after planting and continues to give a good crop for five or six years. Nine years is the average life of a plant. The plant flowers in April-May, and the crop is ready for harvest in October. From the Mysore variety the crops are gathered from Thulām to Eḍavam and from the Malabar variety they are gathered from Thulām to Makarām. The yield which begins from the fifth year varies from 200 to 500 lbs. per acre.

The capsules are dried in the sun or bleached according to the demand of the market. The dried product is sorted into different grades. The cardamom of commerce is a dry, three-sided, oblong or rounded capsule of a yellowish-brown or greyish-white colour. The capsule contains closely packed, triangular seeds of a rich brown colour. These seeds have a pungent, camphoraceous, agreeable flavour. Cardamom is used extensively in medicine. It is considered to be digestive, pungent and hot, and is recommended in phlegmatic affections, such as cough, asthma, piles and diseases of the bladder and kidneys. As a

masticatory and for flavouring sweet-meats, the Travancore cardamom has a reputation of its own. An essential oil, having the flavour and odour of the seed, can be extracted from the seed.

The price of cardamom varies from time to time. Even if the price falls to the lowest minimum, the expenditure for the first four years will not out-weigh the yield in the fifth year. After this period weeding is the only work to be done and for this a sum of not more than six or seven rupees is required for an acre per year.

Considering the fertility of the soil in which cardamoms are now cultivated, manuring may not be required for some time to come. But after some time the cardamom planters have to manure their lands properly.

Cardamom is a profitable cultivation as can be seen from the above facts. In the Ēlamala (Cardamom Hills) several acres of land are being cultivated by people from the adjoining districts of the Madras Presidency, some Europeans and a few Travancoreans. It is said that many acres more are available for cardamom cultivation in those tracts. The cardamom areas are infested with certain pests which hinder the progress of cultivation. Remedial measures are engaging the consideration of the Agricultural Department.

Pepper—Pepper thrives in tropical regions, having a hot moist climate. A rainfall of 100" or more is necessary to produce a healthy crop. Pepper requires a fairly rich soil with free drainage. It grows luxuriantly in Minachil, Kōṭṭayam, Changanāśśēry, Muvāttupulā, Thoḍupulā, Chirayinkīl, Kōṭṭārakara, Paḥanāpuṛam and Neḍumangād taluks. Cuttings are usually planted at the bases of trees, which serve as standards. The trees commonly selected for the purpose are those having a rough or prickly bark, such as jack, mango, erythrina, etc. When there are no trees, standards such as elavu and muṛukku are planted. Propagation is generally made through cuttings and suckers.

Leaf mould mixed with lime is found to be the best manure for pepper. Cattle manure and leaf mould are the manures generally applied by the cultivators. In three years after planting the vine begins to bear fruit. Flowers appear in July and August and the berries are ripe from December onwards. The vine will grow to a height of 30 ft. and more, but for the convenience of harvesting it is not generally allowed to grow to a height of more than 10 ft. to 15 ft. The suckers which it throws out are removed from time to time. The berries are generally gathered before they are fully ripe. If plucked too early, they will be spoiled. After the berries have been gathered, they are dried in the sun till the skin becomes black. White pepper is prepared by removing the skin from the fresh berries by macerating them in water. The average life of a pepper-vine plantation is twenty five to thirty years. The yield varies considerably with the nature of the soil and the locality. In the low country it is only two to three cwts. per acre, whereas in hilly tracts ten to fifteen cwts. is the average.

Pepper possesses valuable medicinal properties. It is found useful in the treatment of intermittent fever, haemophoida, dyspepsia, cough and flatulence, and is believed to promote the secretion of bile. Pepper is also used in the preparation of curries, pickles and chutneys. Pickles made of the green fruits is a delicacy among the people of the Malabar Coast.

The average annual production comes to nearly 12,000 tons. It has been calculated that Travancore produces one-third of the world production. There is a very extensive home market in India for pepper. There has been no question of production. In fact this is one of the few commodities, if not the only one, which have not so far been affected by the problem of over-production. For years pepper commanded very high prices. Peak prices were obtained in 1927 and 1928. Consequently a great incentive was given to pepper cultivation in Travancore.

But from 1929 prices began to fall. Even now the prices have not reached the rates of 1927-1928. If well dried and stored, pepper can be preserved for several years.

The Pepper Farm :— A pepper farm was opened by the Government in Minam 1099 for experiment and demonstration in scientific methods of cultivation, not losing sight of its commercial aspects. It is situated in the Kumpala pakuthy of Pathanamthitta taluk, at a distance of about 21 miles from the Punalur Railway Station, and comprises an area of about 150 acres. Experiments in planting are being pursued there. The rainfall of the locality ranges from 90 to 150 inches. The chief variety under cultivation in the farm goes by the name of 'Kumbakkoṭi' and this occupies about fifty acres. The following are the varieties planted in the farm :—

- | | |
|--------------------|---|
| 1. Kumbakkoṭi. | |
| 2. Karubalānchy. | |
| 3. Munḍa. | |
| 4. Perumkoṭi. | |
| 5. Chumala. | } These three are considered to be early maturing varieties. |
| 6. Thulākkkoṭi. | |
| 7. Mundy. | |
| 8. Kaṛuvally. | |
| 9. Kaṇiakāḍen. | |
| 10. Koṭṭāṇḍen. | |
| 11. Ari-kotṭāṇḍen. | |
| 12. Kuthiravally. | |
| 13. Balomcottah. | } These two are exotic varieties found cultivated in Malabar. |
| 14. Kalluvally. | |

From the mass plantings done on different species of standards available it has been demonstrated that the varieties of Koṭṭāṇḍen and Kaṇiakāḍen give the highest yield of dry pepper, which works out at the rate of about

42 per cent. on the fresh yield. The cultivators have become aware of this fact and there is considerable demand for cuttings of these varieties from far and near.

As regards the selection of standards, it has been found that teak, pēlu, ālānthā and muṛukku have been found to be more suitable than others. Quite recently a plan has been worked out to carry out experiments and investigations on the botanical, cultural and manurial aspects of the crop.

Ginger (Zingiber officinalis)—Ginger is an annual plant growing to a height of two to three feet. Its stem is erect or oblique and is covered by a sheath of leaves smooth and lanceolate.

Ginger requires a warm, moist climate and a medium, light, rich soil. It is propagated by rhizomes. The planting begins in June. Beds, ten to twelve feet long and three to four feet wide, are formed, and in these beds are holes made a foot or less apart. The rhizomes are planted therein. It is usual to fill the holes with manure before planting the setts. The manure most commonly used consists of a mixture of cattle dung, wood ash and leaf mould. For planting one acre, 1,200 to 2,000 lbs. of rhizomes are necessary. The yield varies with the soil and the locality. Under suitable conditions the out-turn per acre is six to eight tons of rhizomes. The crop is ready for harvest in November. Ginger is one of the commercial crops of Travancore, the area under it being 20,000 acres. But the cultivation is not done on a large scale. The biggest holding is not larger than five acres. It is estimated that nearly Rs. 200 can be made as profit by cultivating ginger on a single acre. The cost of cultivation comes to Rs. 200 roughly.

Ginger is sold in the market as green ginger or dried ginger. The latter is more common because it keeps for a long time. Of dried ginger there are two kinds. When the outer skin is retained, it is called "unscraped" ginger. The uses of ginger are many. It is acrid and digestive and is

useful for the removal of costiveness, nausea, asthma, cough, colic, palpitation of the heart, tympanitis, swellings and piles. It is also used in dyspepsia and loss of appetite. The use of ginger in making condiments and pickles is well known. Immature ginger, candied and preserved, is a delicacy. Ginger finds a place in the preparation of beverages like ginger beer, ginger ale, ginger cordial, etc. An essential oil can also be extracted from it.

Turmeric (Curcuma longa).—Turmeric is cultivated in several parts of the State for its rhizomes. Turmeric requires a loamy soil, good manure and plenty of water. The ground must be well worked and formed into ridges, with trenches a foot wide intervening. The setts which consist of small portions of the rhizomes are planted on the ridges about two feet apart. 1,000 to 1,200 lbs. of setts are planted in an acre. The time for planting is usually about the beginning of June, but it depends upon the monsoon. The crop is gathered in the following March or April. After lifting, the rhizomes are scalded in boiling water or steamed in their own juice and dried in the sun or over an oven. As turmeric is cultivated along with other crops, it is difficult to ascertain the correct acreage under it. The yield per acre varies from five to ten tons of green rhizomes, which, when cured and dried, will weigh between $1\frac{1}{2}$ to $2\frac{1}{2}$ tons approximately.

Medicinally, turmeric is described as hot, bitter, pungent, astringent and drying. It prevents skin diseases and is a useful application to swellings and boils. It is an indispensable ingredient in curry powder. It is also used as a dye stuff.

Betel-vine.—Betel-vine is cultivated throughout the State wherever there is good drainage and water supply. It is really a poor man's money crop. It requires a moist situation and a rich soil. Black sandy soil is the best suited. The vine is planted in rows. In some parts it grows well also in soils with clay and red sand. The betel-vine

in Travancore is not cultivated in separate gardens. The ground is levelled and beds are made. The beds are taken in ten feet of land, each bed containing three strings with vines. They are then planted. The cuttings planted are from two to three feet in length. Due care is taken that the cuttings are in the same position in which they were when attached to the branch. Planting generally takes place in the months of September, October, April and May. The vines are daily watered and manured for one week. Periodic watering is necessary to ensure proper yield. The leaves of certain trees and plants, mosses, ashes of the mango leaves, etc., are used as manure.

Fresh shoots appear after a period of nearly three months. Poles are then fixed to the ground and the shoots are tied to them. The manure at the foot is then removed and the vines carefully separated free and lowered down and twisted at the foot of the pole, care being taken in this and subsequent lowerings to see that the original position of the vine is not reversed or destroyed in any other way. The ends or heads are again tied to the poles. They are watered and manured as usual. These processes of lowering down the vines and twisting them down to the foot of the pole is done two or three times a year. When fresh shoots appear after these processes, the ends of three or four vines are tied to a string which is fastened to the top of a branch of the tree.

One year after planting the leaves may be plucked for use. They are generally plucked once in three days. The vines yield the maximum number of leaves during the rains in September, October, November, June and July. There are three varieties of the vine, namely, the ordinary, the *thūlasikkoṭi* and the *kannikkoṭi*. The first two yield after a year and the third after six months. The leaves of the *thūlasikkoṭi* are darker in colour and are so called on account of the *thūlasi*-like smell. The leaves of the *kannikkoṭi* are white and thick. The *kannikkoṭi* and *thūlasikkoṭi* varieties

may be grown on trees, while the ordinary one is grown on strings fastened to trees and consequently requires more labour. The kannikkoṭi yields the largest number of leaves and as it yields earlier, it is also the most profitable. But there is this disadvantage, viz., that the creeper dies after eight years, while the other varieties live much longer. Attention is always necessary.

There is an attempt now to cultivate the Madras varieties also. The leaf is used for chewing pansupari. It is a valuable stomachic and has medicinal properties. Betel leaves are presented on ceremonial occasions to invites and are used in religious functions.

Chillies. There are numerous varieties of chillies in popular cultivation in Travancore, but the chilly ordinarily grown is the large, dry, red chilly of commerce. The ground is prepared about July and December or January, when the seeds are sown in nurseries and the seedlings transplanted two to three feet apart each way. Underwood is cleared and water is let in every four or five days. The plant begins to flower in about four months from the date of planting. There is regular picking of chillies up to six months, when the plants become old. The chillies are picked, dried in the sun and stored. Dry chillies are sold in the market by weight. Travancore imports a large quantity of chillies, which are the principal ingredients in all curries and condiments. They promote digestion.

Tamarind. This tree grows throughout the State. People do not generally cultivate it as it is a slow grower. Being deep-rooted, it retards the growth of other trees and plants. No manure is applied. The pulp of the plant is an indispensable item in curries. The seeds are roasted and given largely to working cattle. There is a considerable export trade. At Mārthāṇḍam the tamarind is cleaned, finely packed and exported. In South Travancore great care is taken of tamarind trees.

Coriander, Cummin seed, Mustard and Fen-greek are not cultivated on a commercial scale.

Coconuts (*Cocos-nucifera*)— The coconut palm is the second most important crop. It is the chief money crop of the State and forms one of the main sources of revenue. The palm is a perennial which takes ten years to come into commercial production and then continues to yield profitably for about fifty years. Long before the trees cease to be productive, under-planting is possible so that an area once planted with coconuts remains under the same crop ever afterwards. Coconut products constitute the bulk of our exports. The tree supplies raw materials for several industries. The taxes on this palm bring in more than a fourth of the land revenue and the export duties on coconut products about one half of the customs revenue. The crop occupies more than a fourth of the total cultivated area. Indeed the coconut has been aptly described as the wealth of Travancore.

The coconut palm grows almost everywhere. In the lowlands coconut forms one of the main crops. The midlands and the slopes of the highlands are also best suited for its cultivation. The sea board, the shores of the lagoons and the banks of rivers are studded with coconut trees. Coconut cultivation is now extended to higher elevations about forty to fifty miles from the sea.

The coconut tract of the lowland division can be subdivided into

(1) the strip of land along the beach the soil of which is almost pure white sand. The strip varies in width from half a mile in some parts of the Quilon division to about five miles at Shert'hala. When chemically analysed, the soil is very poor, but it is on this sandy beach that we see the best coconut grown in Travancore. There is a free under-current of sub-soil water which coming far inland brings to the coconut roots all the plant food they need.

(2) The tract towards the east of the sandy beach the soil of which consists of comparatively new alluvial deposits brought in by the rivers. The soil is rich in alluvium, often black in colour on account of the large proportion of organic matter. The defect with this soil is that it tends to be stiff in some parts. This can be corrected by applying sand and ash.

(3) The tract known as 'Ōṇāṭṭukara,' extending from Haṛipād almost as far south as Quilon. The soil is a sandy loam much more open and pale in colour than the fresh alluvium of Kuṭṭanād. There is less organic matter in the soil which is, however, more clayey than beach sand. The roots of the coconut tree can, therefore, lift water from greater depths. There is an under-current flowing from the low hills, which helps to feed the palms.

(4) The eastern half of the lowland division to the south of Quilon. Here the soil is not very rich in plant food, though it supports quite good coconut plantations.

In the midland division the coconut grows along the banks of rivers, in the valleys and on the slopes of hills. The coconut tracts in the highland division also consist of the slopes of hills and the valleys between them. The trees grow very well and the quality of the nuts is superior.

According to the official estimate, the area under coconut cultivation in 1934-35 was 5,66,590 acres, which was about fifty per cent. higher than what it was sixteen years previously. This is rather an under-estimate. The cultivation is not on a plantation scale. The palm is grown in every back garden and is in fact ubiquitous. It is therefore difficult to gather correct figures. It may, however, be observed that more than forty per cent. of the Indian coconut area lies in Travancore.

The following table will be of help for purposes of comparison.

<i>Countries.</i>	<i>Area in acres.</i>
Madras Presidency.	5,56,827
Mysore.	1,62,583
Travancore.	5,22,623
Bombay Presidency.	27,689
Cochin.	67,349
Bengal Presidency.	12,300
Burma.	9,873

In other countries the coconut is a plantation crop. Individual estates are hundreds, and sometimes even thousands, of acres in extent. On the other hand, Travancore is pre-eminently the land of the small landholder. Large areas under any single owner are very rare. Thus coconut cultivation in Travancore has seldom been on an organised plantation scale. There are very few gardens which are more than ten acres in extent. The average size of the coconut plantation on the west coast is two acres.

Another feature is that many of the coconut gardens are very old. Once the palms are established in a garden, they continue to occupy the ground for decades together and then begin to decline, not altogether but one by one, at fairly long intervals of time.

The Travancore plants do not present any uniformity of stand. Some are very old, while others may be just coming to maturity. They do not stand in regular rows and there is hardly any uniformity in spacing. It is very difficult to introduce into such small and irregularly planted areas improvements in the system of tillage, manuring or harvesting.

Hardly an acre in our gardens is exclusively reserved for coconuts. Plantains, yams and many other kinds of catch-crops are often grown between the palms. Arecanuts, jacks and mango trees compete with them perpetually.

* The figures are for 1932-33.

Varieties:—The cultivators recognise several varieties which are mainly based on the colour, shape and size of the nut, the height and girth of the stem, the fullness of the crown, the age at which the palm commences to yield and the length of the leaf. As cross-pollination takes place freely, the maintenance of particular types is not easy. But some of the varieties may be easily indentified. The chief varieties of the coconut are:—

- (i) Ordinary. Average yield per year is 110 nuts.
- (ii) Chenthengu. The leaves and fruits are slightly red. Ten years are required for bearing. The average yield per year is sixty nuts.
- (iii) Gauḷipāthram. The leaves and fruits are light orange in colour. It requires eight years for bearing. The average yield per year is sixty nuts.
- (iv) Eighteen months' tree. (Nakkuvāri or Nicobari). A tree of stunted stature with very small fruits. The period required for fruiting is eighteen months. The average yield per year is thirty nuts.
- (v) Kappal-thengu. The fruits are very large. The palm requires six years to bear. The average yield is twenty nuts per year.
- (vi) Yāppāṇam. (Jaffna coconut palm). The size of the fruit is twice as big as that of the ordinary kind. In tender ages it yields sweet water of larger quantity and the kernel when ripe contains a greater quantity of oil.

The Kappal, Chenthengu and Gauḷipāthram are not used for curry purpose as they do not contain as much oily matter as the others. Some of the other varieties are:—

- | | |
|--------------------------|--------------------------|
| (1) Āttingal. | (24) Paḷikkal. |
| (2) Parūr, No. 1. | (25) Authengu. |
| (3) Parūr, No. 2. | (26) Java kappaṭhengu. |
| (4) Niçobar. | (27) Vaḷḷikkōḍan No. 2. |
| (5) Thangaśśēry. | (28) Green coconut. |
| (6) Kāñjirappally. | (29) Elāṭhengu. |
| (7) Neḍuvarian, No. 1. | (30) Aṛikulayan. |
| (8) Do. No. 2. | (31) Kanakaṭhengu. |
| (9) Kaṛimthengu. | (32) Panayan. |
| (10) Chenthengu. | (33) Elanthengu. |
| (11) Thonḍan. | (34) Pacchaṭhengu. |
| (12) Goa. | (35) Mysore Ceylon dark- |
| (13) Chāvakkaḍan. | green. |
| (14) Kappaṭhengu. | (36) Do. dwarf. |
| (15) Maṇian. | (37) Ceylon dark pale- |
| (16) Śarkaṛai. | green. |
| (17) Changanāśśēry. | (38) Do. red. |
| (18) Vaḷḷikkōḍan. | (39) Do. green. |
| (19) Kūriṭhengu. | (40) Do. king. |
| (20) Naiṭhengu. | (41) Singapore. |
| (21) Muvāṇṭan. | (42) Tiptore. |
| (22) Sūryakānṭhi thengu. | (43) Red king. |
| (23) Gauṛigāthram. | |

Of these varieties Thonḍan and Neḍuvarian are disease resistant. The same may to some extent be said of another variety called Kūriṭhengu.

The yield varies according to the soil, the climate, the care taken and the variety grown. Some trees yield 200 to 300 nuts a year. Sixty to eighty nuts per tree per annum is a good average yield, but forty nuts per tree per annum is the average. The palm will yield for seventy to eighty years. Unless a judicious system of manure is adopted, the yield will decrease considerably after the middle age of the palm. The Banking Enquiry Committee has estimated the average yield from one acre at 2,000 nuts to 2,500 nuts

per annum, which in normal times can fetch about Rs. 120 to 150. Excluding the cost of cultivation, the net annual income from one acre is calculated at Rs. 75 to Rs. 100.

The consumption of coconut in Travancore has been estimated at the rate of fifty nuts per annum per head of the population, and by adding up this figure to the total of exports, the total production may be estimated. Calculating this way, the annual production in Travancore will amount to not less than 25,00,00,000 nuts.

The coconut palm is propagated by seed. Ripe nuts are collected from palms of 20 to 25 years' growth and used as seeds. After being kept for four or six weeks, they are planted in the nursery one foot apart. Sometimes the ripe fruits are left exposed to the heat and moisture till they sprout and are then planted. Before planting, seed beds are prepared two feet deep. The soil in the nursery is mixed with river sand and manured with wood ash and salt before the nuts are planted. The nuts are laid on their sides, two inches of their surface being left exposed. The beds are then watered once a day except during rainy seasons till they take root, and after that they are manured every month till they are transplanted. The seedlings will be ready for transplantation in about a year. The coconut palm requires plenty of free air and sunshine and the least distance at which seedlings should be planted is 30 to 35 feet. Ordinarily, the dimensions of the pits are 5' x 5' x 4'. Ashes, dust and coconut husk are put into these pits and left to rot. Sometimes sand and salt also are mixed with the earth. In some places arrowroot and turmeric are grown near the foot of the coconut plants to prevent them from destruction by white ants. After transplantation the plants are watered daily till new roots sprout. During the first year they are manured once or twice every month. As the plants grow, a judicious system of manuring should be adopted. A mixture consisting of wood ash, fish manure and oil cakes has been found to be a suitable manure for

the coconut palm. Application of salt at the rate of one to 1½ lbs. per tree produces beneficial results. Manuring is done best at the beginning of the rainy weather. Five to ten years after planting the plants begin to bear fruit. The time required for fruiting depends on the locality.

Cost of cultivation—The principal items of cost to be considered are the value of the land, the cost of opening it up, planting and nursing the seedling till the palm attains full maturity, the cost of all annual cultivations and manuring, harvesting and processing the product for sale, and the rates and taxes, if any, which are levied by the Government. The price of land depends on various factors and varies from place to place. The price of an acre of land fit for coconuts ranges from Rs. 50 to 500 in uplands. But in the lowlands an acre may cost not less than Rs. 1,000. The cost of planting and rearing the palm may vary directly with the nature of the soil. The cost of developing an uncultivated plot in the midland division into a garden of bearing coconuts has been estimated to vary between Rs. 500 and Rs. 700, land and trees together. The Travancore Banking Enquiry Committee found that the average price for an acre of garden in the lowland division varied between Rs. 900 and Rs. 1,300, though individual gardens had been sold as dear as Rs. 5,000 per acre.

As already noticed, in most of the coconut gardens of Travancore the present stand of trees is not uniform. It would not therefore be fair to draw averages of costs on an acreage basis. Making estimates per tree, every thing considered, the average price of a fairly good bearing coconut tree in Travancore may be estimated to be about Rs. 15.

Recurring or working costs :—These come under three heads, viz., government dues, cultivation charges including harvesting, and the marketing charges including manufacturing and transport to the market as well as commission to the brokers and middlemen. Under government dues

the cultivator has to pay about 4 as. per palm in full bearing. Under cultivation charges, the average cost of manures and manuring may be about 6 as. and other tillage charges may cost about 2 as. per tree per year. The cost of harvesting may be estimated to be one anna per tree per year and another anna has to be added to the costs for watching, fencing and other miscellaneous charges. The total cost of cultivation will thus amount to ten annas per tree per year. The costs of cultivation and manuring incurred by the cultivator in Travancore are not the actual out-of-pocket expenses. The labour on the farm is supplied mostly by the owner and his family. No cost on supervision is incurred. The holdings are small and the owner and his family have to live on the products. If they do not work in the farm, they have no other work and therefore they have been setting a maintenance charge on their labour.

Coconut pests.—The cultivation of coconuts has received a very serious set back owing to the several pests it has been subjected to. The plant usually suffers from white ants, beetles and worms. The white ants affect the growth of the plant in its infancy, while the beetles and worms appear later.

Coconut diseases.—Of the diseases which attack the coconut palm, the most pernicious is the wilt or root disease. This disease exhibits itself chiefly in a general discolouration of the outer whorl of the fronds. Each frond turns yellow from the tip backwards. The leaflets dry up prematurely, curl back and may even break off. The discolouration spreads rapidly to the inner whorl so that a number of discoloured leaves in various stages of decay may always be found on any diseased tree. Very young leaves do not turn yellow, but their tips often drop distinctly downwards indicating a weak rachis. With the first development of the discolouration on the leaves, there generally is a heavy shedding of all the immature nuts. Such trees may not mature any crop for a period varying

from six months to a year. Thereafter the shedding of nuts decreases and only fewer nuts are borne per bunch. These nuts are smaller, with thinner husks, softer shells and poorer kernel. Even the milk becomes insipid. The copra manufactured from such nuts yields less oil than the normal copra.

The progress of the disease on infected trees is very slow. Trees which receive a reasonable amount of attention continue to yield crops of nuts for many years after the onset of the disease. But the crown dwindles in size steadily, though slowly, and the yield decreases until the tree dies sooner or later. No case of positive cure is known, although it has been observed that the trees sometimes show marked improvement.

In Travancore the disease was first recorded about fifty years ago from the village of Īrāttupēṭṭa and around Kāyamkulam in the Ōṇāṭṭukara tracts. From these isolated centres the disease has all along been steadily spreading. Extension has been most rapid along the banks of the rivers. Almost the whole of Central Travancore may now be said to be infected.

When the attention of the Government was first drawn to this disease, there was no separate Department of Agriculture. It was therefore referred to the Conservator of Forests, who reported that it was a form of bud rot disease which was then causing much havoc among the palms on the east coast of British India. Later, Dr. G. J. Butler, Imperial Mycologist at Pusa, visited the infected areas in Travancore. As a result of the investigations, he reported that the disease was entirely different from the bud rot of the east coast and that it was a root disease, probably due to a *Botryodiplodia* which he detected in the roots of the different palms. He suggested certain cultural treatments to keep the disease under control and the Department of Agriculture which was organised about that time set itself to popularise those control measures.

The steps now taken to keep the disease in check consist of proper tillage and judicious manuring. Each infected area is visited and the soil conditions carefully studied. Where drainage is defective, steps are taken to improve it either by opening drains or by applying lime and river sand to the soil. The application of lime is also meant to hasten the decomposition of the organic parts in the soil. The requirements of each soil are taken into consideration in giving advice. The measures adopted by the Government have been found to be effective in checking the deterioration of the affected trees and in thus prolonging the period of their profitable cropping.

The causes of the disease still remain unknown. Attempts have been made to isolate the *Botryodiplodia*. Only very few of the specimens examined gave the fungus, and repeated inoculation experiments with the fungus gave negative results. Other fungi, also isolated from the affected tissues, have not so far been found to reproduce the disease nor have the tissues from the affected parts yet shown the constant presence of any pathogenic organism. The investigation is being continued.

Leaf rot is another very widely distributed disease. It occurs very often along with the root disease on the same tree. This disease starts at the tip of the innermost spear on the tree and works its way down along the surface. Before the rot reaches far into the heart, the spear grows too old and tough for it and then the disease passes on to the next inner spear. Thus all the fronds are damaged in succession. On each affected frond the leaflets, especially those towards the tip of the rachis, rot off more or less half way down their lengths. The destruction of these leaflets leads to a weakening of the trees. The crown steadily grows smaller and the yield decreases. Only in very advanced cases is the cabbage affected and then the trees die. This disease is believed to be due to a weak fungus parasite the identity of which is not well understood. Efforts to reproduce the

disease artificially have not been very successful. The disease may, however, be kept under control by cutting out the affected fronds and painting the fresh wound with some antiseptic. •

Leaf blight is a disease affecting mature palm leaves. It is caused by the fungus *pestalozzia palmarum*. The disease called stem bleeding is confined to places where the drainage conditions are unsatisfactory. The characteristic feature of the disease is the exudation of a rusty brown fluid from the affected stem. This is caused by the action of the fungus. Leaf stock rot and fruit rot are among the minor diseases of the coconut palm.

Arecanuts. The Areca palm is perhaps "the most graceful and elegant of the Indian palms" and is of remarkably erect growth with a slender cylindrical annulate stem. The nuts hang in bunches just below the leaves. The one peculiarity of its cultivation in Travancore is that it is not irrigated. But it has been found that if irrigated it will bear more nuts. The soil best fitted for its cultivation is where there is a large quantity of alluvial deposit and where water is available. The water level should not be low. The areca grows luxuriantly on the banks of rivers, canals, backwaters and in low valleys. It is cultivated in all the taluks, though in some of them there is a larger number of palms with larger yield. It does not thrive well in areas where there is no sufficient rain. In lower areas the planting is done by sowing seeds at stake from February to June. Where there is plenty of soil-moisture, transplantation is also done by one year grown seedling. The cultivation of this palm is very easy. Eighty areca palms can be planted in one acre. The period required for bearing is four to five years and the tree continues to bear for twenty five years. It yields three to four crops at an average of four bunches. The maximum number of fruits is obtained in the months of Kanni, Thulām and Vrischikam and the minimum in Chingam. There are many varieties but the

important ones are the Kappakḍakka, the Kaṛappuram and the Kiḷakkēkaṛa or the Mīnachil nut. The palm ordinarily yields 80—300 nuts per year.

Arecanut is used for chewing pansupari. It is an excellent dentrific. The leaf sheathes are used as vessels for bathing children and for making baskets, caps, umbrellas and dishes. The stem is strong and flexible and is used for minor agricultural implements and fencing. A wild species of areca grows in the reserved forests. The hill tribes use this as a substitute for the common betel-nut.

The palm is generally attacked by the Kula Roga or the mahira which affects the tender fruits highly.

Cashewnut— The cashewnut (*Anacardium occidentale*) is a native of Brazil, which is believed to have been introduced into Travancore by the Portuguese during the latter half of the 16th century. It is a tree that thrives on any soil and is found in most parts of Travancore, growing wild on waste land, particularly in the coastal tract. Within the past decade, however, the marked increase in the export trade in this nut has given a new impetus to cashewnut cultivation in the State, and this crop is now being systematically cultivated over extensive areas like rubber and other plantation crops.

The present area under cashewnut in Travancore is 24,975 acres. The taluks of Trivandrum, Neḍumangāḍ, Chirayinkil, Koṭṭāṛakaṛa, Paṭhanāpuram and Kunnathunāḍ have each over 2,000 acres under this crop, while in the two taluks of the old Dēvikulam division, cashewnut is conspicuous by its absence. Apparently climatic conditions in this part of the State are not favourable. New plantations of cashewnut are now seen in many parts of the State. The area is increasing.

The production of cashewnuts is computed on the basis of 250 trees per acre and an average yield of 20 lbs. of raw nuts per tree. A deduction of 25 per cent. in the total area is made for trees which either have not arrived

at the full bearing stage or have passed it. The estimated total annual production of raw cashewnuts in Travancore thus works out to approximately 41,800 tons. The production of cashewnut is seasonal, being confined to four months of the year, viz., Kumbham, Minam, Meḍam and Eḍavam. During the rest of the year there is no crop whatever. Only one variety of cashewnut is grown in the State.

Sugarcane—Sugarcane is a crop which requires a rich and deep soil, heavy manuring, plenty of moisture and constant attention. Hence its cultivation is at present confined to the rich alluvial banks of the rivers in Central and North Travancore. The area under the crop in 1111 was 15,025 acres. Of these nearly 8,000 acres were in the taluks of Thiruvalla and Paṭhanamthiṭṭa on the banks of the Pampa and its tributaries. Almost the whole of the crop is used in the manufacture of jaggery known locally as Śarkaṛa for which there is a large market within the country. The consumption is steadily increasing.

Sugarcane in Travancore is almost entirely a rainfed crop. The plantations are all in flat alluvial pockets in the undulating banks of the principal rivers. The setts are generally planted from February to April. The few showers which may normally be expected to fall during these months are generally sufficient to start the canes. If, however, the drought is too severe or prolonged, they may occasionally be hand-watered. The soil between the canes is lightly dug up and a top-dressing of ashes, fish manure, oil cakes and even chemicals like ammonium sulphate is applied with the ante-monsoon showers in May. The south west monsoon breaks out in torrents in June and many of the cane fields will be more or less submerged under floods. These floods bring a deposit of rich silt into the fields and do not generally stand long enough to injure the cane. The rains continue well on to the close of November with only a short spell of dry weather in September. December is generally dry and cold and then the canes ripen. The harvest

commences in January and extends well on to April. The cane is almost all crushed in three roller iron mills worked with bullock power, and the juice is boiled down to gur in open pans over pit furnaces which burn mostly the megass and trash. An average crop yields about twenty tons of canes from which the ryots recover about two tons of gur, but yields of four to five tons of gur have occasionally been obtained from specially rich fields or under intensive farming. Ratooning is a regular practice. Two to three ratoons are the rule, but occasionally the shoots have been kept on for a longer period with very satisfactory results.

Local canes lodge very badly. The ryots tie up the canes to stout poles driven into the ground. They wrap the trash round individual canes to protect them from jackals. These two operations cost a great deal which should be saved by introducing better varieties of cane.

The Coimbatore and P. O. J. varieties which have been recently introduced are definitely better than the local strains in these respects. But the P. O. J. canes particularly arrow about the month of September. Planted from February to April, these canes will be only about six to eight months old when they begin to arrow. The crop will be poor. Attempts are therefore being made to plant the canes about September-October so as to give them about a year to grow before they begin to arrow. This, however, involves the maintenance of the growing cane in the field throughout the dry weather, which in turn would necessitate frequent irrigation. Further, the harvest comes off during the rainy season, when the canes still continue to grow. The sugar content in the canes will therefore be low.

Sugarcane growers complain that the gur obtained from canes manured with ammonium sulphate does not set as hard as that from other canes manured only with ashes. This objection stands in the way of a more general adoption of heavy manuring and intensive farming.

We have a rich variety of vegetables. As pointed out in the beginning of this chapter, the peculiar seasonal conditions and the varying altitudes of the country make it possible for Travancore to grow all the tropical vegetables and some of the common English vegetables grown only in the temperate regions. Vegetable cultivation is very profitable. But only a very few percentage of the population has taken to it as a profession. Vegetable has been accepted as a main item in the garden cultivation of the State. In vegetables Travancore nearly maintains a standard of self-sufficiency. Different varieties of gourds, beans, chillies, brinjals, greens (*Amaranthus*), ladies' fingers, drum sticks, etc., are grown on the plains and some of the English vegetables like the potato, tomato, cabbage, cauliflower, etc., on the hills.

Vegetable cultivation demands scrupulous care and attention. The places for cultivation must be selected, for all vegetables do not thrive in all soils. The most suitable is sandy loam with plenty of organic manure. Availability of water is one of the essentials of this cultivation. The sub-soil should be loose so as to allow water to sink down. Otherwise, facilities must be made for the water to drain off. The soil should be dug deep and prepared well before sowing. Leaf mould, cattle dung, horse manure and ash are the best manures for vegetables. Only the best available seed should be selected, for the yield depends entirely on the quality of the seed used. Transplantation produces better results. Young plants should be watered twice daily and manure periodically applied. The prevention and destruction of pests is an essential condition.

As cultivation extends, pasture lands available for the grazing of cattle are getting diminished. The ryots look to the Government to provide grazing grounds for their cattle and they even go to the extent of suggesting that the Government should acquire

Fodders.

private lands where waste lands are not available and set them apart for grazing. The ryots can easily produce fodder by devoting a portion of their holdings to the cultivation of fodder crop. The Agricultural Department is encouraging the cultivation of two valuable fodder grasses—guinea grass and napier grass.

Guinea grass--This is a kind of fodder crop that has been introduced by the Agricultural Department. It grows in thick bushes to a height of three to four feet in good loam soils. In poorer soils its growth is not bad if it is properly manured. It can be cut at least once a month during the rainy season. If not irrigated, it will remain dormant during the hot season. It has been found from experience that guinea grass is one of the best fodder crops suited to this country.

Napier grass—This was got down in 1102 from Ceylon. This grows without irrigation. Napier grass gives 20,000 lbs. under irrigation and 15,000 lbs. without irrigation for an acre. It can be cut once in fifteen to twenty days.

Several other fodder crops as chōlam, Kikiyu, American Sorghum, Jowar, Shevri Spineless cactus, ragi, Iora Bafri, soya beans, horse gram, Ieosin, buffalo grass and carpet grass were tried in the Government experimental farms. But the guinea and the napier grasses were found to be specially suited to this country, and their cultivation is being encouraged by the free distribution of seeds and tussocks.

Plantain—The cultivation of the plantain engages the attention of a good portion of the agricultural population. It

is carried on in a large scale throughout the

Fruits.

country. Almost every house garden has a few plantains in it. There are several varieties. Almost all kinds of soils in the State are suited for plantain cultivation, but an admixture of sand and clay is the best. The banana variety thrives well on the low banks of rivers, where the

silt deposited by the annual floods enriches the soil with food contents. But when sufficient care is bestowed, the banana thrives in all parts of the State, lowlands and highlands. In the case of special varieties particular attention and heavy manuring have to be given. Each variety of the plant has got a special characteristic of its own. The following are some of the varieties :

Monthan.	Pūvan.
Paḍatti.	Malampūvan.
Pālayankōḍan.	Āyirappūvan.
Aṇṇān.	Nacchingan.
Mangalapuṛam Aṇṇān.	Kappa (Chevvāḷa)
Kūmpillā Aṇṇān.	Pacchaveṭṭan.
Kaṇṇan.	Pēyan.
Chempa Kaṇṇan.	Kuḷivāḷa.
Chāmpa Aṇṇān.	Malavāḷa.
Kadaḷi.	Kalluvāḷa
Thēvan-Kadaḷi.	Mūngil.
Thēn Kadaḷi.	Peṛumpaḍala.
Kaṛinkadaḷi.	Chāmpel Monthan.
Chenkadaḷi.	Banana, etc.
Thonṭankadaḷi	

Some of these varieties are used in preparing curries. Others are good as fruits. Some are used both as vegetables and as fruits. Varieties used as vegetables are also used as fruits, but some of them which are specially valued as fruits are not good to be used for cooking purposes. Monthan, paḍatti, banana, aṇṇān, pālayankōḍan and pēyan are the varieties used as vegetables. All others are used as fruits.

Prices vary from three to twelve annas per hundred according to the quality and size of the fruits.

The ground is at first hedged in to prevent cattle from straying in. It is then ploughed and furrowed. Where the ground is uneven, terraces are formed. Where it is not fit for ploughing, spade-work is done. Greatest attention

is paid to the conservation of manure. Pits are dug each two feet cube and half the depth is filled with dry leaves, rubbish and ashes. The shoots or suckers are then planted and the pits covered with manure. There is no particular planting season. They are planted in all months in the fields. In the northern districts the planting is done in Karkaḍakam just after the south west monsoon. In other places Minam, Dhanu and Makaram are the favourite months. About 500 suckers are planted in an acre of ground. It takes eight months to flower and two to three months more for the fruit to mature. The number of fruits in a bunch varies according to the variety. In the case of the bigger fruits fifty is the average, while the number ranges from 200 to 300 and more in the case of pālayankōḍan. The plant is cut down after the fruit is gathered. The leaves are used as plates for rice and other food to be served upon. The white core inside the plant is also used as a vegetable. The bunch taken along with the stem is used for decoration purposes. New shoots spring up from the old stems and thus the cultivation is carried on. This again is the poor man's money crop. Its cultivation is very profitable. The poorest ryot can make his own by growing enough trees either on his own lands or on pāṭṭom lands. The plantain is very nutritious and wholesome, either ripe or raw.

Bananas— This variety is cultivated throughout the country and forms an important annual crop in some places. A bunch may contain thirty to sixty fruits arranged in clusters and will sell for eight to twelve annas at the plantation. The bunches are cut before the fruits are fully ripe and they are ripened artificially. Unripe fruits are cooked and eaten. They are also cut into thin slices, fried in coconut oil and sometimes coated with sugar. This preparation is very much liked by the people. Ripe fruits sliced lengthwise, dipped in butter and fried until they are crisp and light-brown make another excellent preparation. Banana meal prepared out of unripe but matured fruits is a nutritious

food for children. When dried, the fruit may be preserved for many months. For drying, bunches containing fruits of good size should be specially selected and carefully ripened. The fruits when well ripe are separated from the bunches and exposed to the sun for two or three days until the skin turns black and can easily be peeled off. After peeling they are dried again for a week. When prepared in this way, they will keep for a considerable length of time owing to the concentration of sugar in the fruits. Banana is available in the market from August to February.

Mango.—This is very abundant all over the country. It is an evergreen tree blossoming from February to April according to situation, the fruit ripening from May to July. There are several varieties. Some of them are good for curries and pickles, while others are better as fruits. The latter are commonly known as vaṛikka mangoes. The mango tree is propagated by planting seeds. Grafting is now very common. The grafts thrive well but not always on a commercial scale, as the rains prevent their mature ripening. The wood of the mango tree is used as fuel and for building canoes and sometimes for houses and furniture.

Jack. This is a valuable tree both for its timber and its fruit. It is largely grown throughout Travancore and costs very little labour. The mode of propagation is very simple. The seed is put into the ground in pits. It germinates and grows up. Propagation by the transplantation method is also followed. The soil near the hill sides is more suitable for the growth of the jack. It bears fruits in six or seven years. The fruit grows to a large size. It hangs by a peduncle from the stem and larger branches. There are two varieties—the kūḷa and the vaṛikka. The vaṛikka is a delicious fruit highly valuable and always fetches a good price in the market varying from six annas to a rupee. The kūḷa is generally used for making curries, as, when ripe, it has not got as much attraction as the vaṛikka. The tender green fruits known as idicchakka or koṭhan chakka are

also used for preparing curries. The timber is very valuable. It has a beautiful yellow colour when cut and admits of extreme polish. It is used for building houses and for making articles of furniture.

Breadfruit—This is a variety of jack the fruit of which, when unripe, is used for the preparation of curries.

Pine apple—The pine apple plant is now cultivated only as a subsidiary crop, but its cultivation can considerably be increased if a proper market could be found for the fruit. A large extent of lands now lying waste can be brought under this crop. There are three chief varieties under cultivation. Two of them are indigenous and the other is imported. The imported variety bears large-sized fruits conical in shape, and its leaves have no spines. The quality of the fruit is not as good as that of the oblong, medium-sized yellow fruit of one of the indigenous varieties, called Śīma chakka. The latter is better suited for preservation in syrup, while the imported variety, because of its highly succulent flesh, is more useful for the preparation of pine apple syrup. The fruit season is generally from July to September. Carefully packed, pine apple will stand rough handling and will remain in good condition longer than any other tropical fruit. The leaves of the plant yield a fine fibre.

The Fruit Farm—The Government opened a Fruit Farm at Cape Comorin with the main object of popularising fruit culture in the State. The soil and climate of South Travancore comprising the taluks of Thōvāḷa, Agasthīswaṛam, Kalkuḷam and Viḷavancōde are admirably suited for the cultivation of certain tropical fruits. The Farm was opened in the year 1922 and ever since the planting of different varieties of fruit-trees obtained from various parts of India has been in progress. Varieties of graft mango, oranges, papayas, custard apple, grapes, pomegranates, guavas, rambutan and lovelovi were the first to be planted. Many of those failed to fruit satisfactorily partly because

of want of their adaptability to the local conditions and partly because they came of poor stock. Such varieties are being gradually replaced with plants raised from selected trees in the Farm.

Coffee—The first clearing for coffee in Travancore was made by Mr. D. Munro in the Hope Estate in 1862.

It was followed immediately by General Plantations.

Stevenson on Woodlands, by Rolent Backer on Stag Brooke and by F. G. Richardson on Twyford. These were the pioneers of coffee planting in Travancore. The coffee seed for the first three estates mentioned above was procured from Wyanad, while for the last the proprietor secured seed and plant from some old coffee trees growing indigenously in some of the garden compounds of Kōṭṭayam. These coffee seeds, when they arrived in India, were late for the hills. Making a virtue of necessity, those who brought the seeds made nurseries in the plains. When the new clearance in the hills was ready for plantation, the plants were carried up to the estate on coolies' heads. Though the trees from which the seeds were obtained were grown under ordinary conditions, never topped nor pruned, the result was in every way highly satisfactory.

In 1866 the proprietor of the Twyford estate sold his share and migrated to the Periyār Valley some ten miles to the east of Pirmāḍe, where he opened up three blocks, namely, Chathikarum, the first block of land sold by auction under the first rules for the realisation of land revenue on the Travancore hills, Chenkaṛa, Pekamum. For about nine years high yields, from 10 to 15 cwts. per acre, were obtained. Not only was the yield highly satisfactory, but the quality of the coffee also was particularly fine. The climate and soil of the Periyār Valley were found to be perfect for coffee. Coffee was the chief crop of the other planting districts also which had been formed one by one.

But bad times came soon. In 1875 a leaf-disease appeared and its ravages became terribly serious. The planters had to desert their coffee estates one by one with the result that the acreage under coffee was reduced considerably. The acreage under coffee cultivation in 1936 was only 967 acres. Even this acreage was spread in scattered units, 17 in Thōvāḷa, 15 in Sheakōṭṭa and 847 in Dēvikulam. Of late two varieties of coffee, the Liberian and the Robusta, have been found to be suitable, as the pest which destroys the plants in Travancore would not affect these varieties. The Robusta is the more popular of the two. It is raised as a garden crop in Travancore and its cultivation is extending to a large scale in the high midland and the highland tracts. Robusta coffee can be very successfully cultivated in places the altitude of which ranges between 1,500 and 1,500 to 2,000 feet. It can be grown in sandy soils and clay loam, but only where there is a good sub-soil drainage system. In that respect it is more or less like the coconut.

The seeds are to be sown in loose clay loam soil with plenty of organic ingredients. A small bed, seven or eight feet in height, half shady, should be the nursery. The seeds should be sown in small plots, raised nearly three feet, at equally distant places and covered with soil half an inch thick. Water should be sprinkled to keep the plots completely wet. When the seedlings appear with two leaves, they should be transplanted. The transplanted plots should be manured well and watered frequently. In ordinary fertile soil, the spacing should be eight to nine feet. After four or five months the plants should again be transplanted. They would be six to seven feet in height at this time. The branches should be cut off and carefully transplanted so that the soil around the root is not disturbed. In places where coffee is cultivated there should be shade trees, preferably coconuts. Robusta coffee grows up to a height of twenty feet. Weeding should be done occasionally and manuring also.

Robusta coffee is exported from Travancore in large quantities to Viruthunagar, at which place it is cleaned and graded. It may be observed that the same coffee is reimported to Travancore.

Tea—Tea is a very important plantation crop in Travancore. Although the tea bush has been cultivated for over a century in Northern India, it is only within comparatively recent times that it has been introduced into Southern India. It is difficult to say where tea was first planted in South India. But if Travancore cannot actually claim this distinction for certain, at all events it was flourishing in this State within a very few years of its first introduction to the south. The State possesses large tracts of highlands that are peculiarly suited to the cultivation of tea. These tracts which, previous to the advent of the tea and coffee planters, were clothed with magnificent primeval forest, the home of the elephant, the tiger, the bison and the sambur, are now the centre of a flourishing industry, no less than forty eight thousand acres being planted, producing over twenty two million pounds of fine tea annually. Every year more land is being brought under it. When it is remembered that the total production of tea from all the other tea producing districts of South India put together is only twenty million pounds, the important position which Travancore holds in this industry may be well appreciated.

The policy of the Travancore Government has always been to encourage tea plantation. Formerly the planters were all of them Europeans. But now many Travancoreans own good tea estates. The Government now derives a considerable revenue in the form of land rent, export duty and income tax. A few of the oldest tea estates in Travancore are planted with the China variety. But the Assam and Manipur species, or more correctly, hybrids of them, are those generally cultivated. This is due to their better yielding qualities. Given a suitable rainfall (not less than 70 inches per annum) and a fairly equable climate,

tea will flourish from the sea level to 7,000 or 8,000 feet elevation, and plantations are to be found in Travancore at widely different altitudes. Generally speaking, however, the quality and flavour of the tea improves as the altitude at which it is grown increases, and the exceptionally fine quality of the teas produced in Travancore is largely due to the fact that most of the estates have been opened on the high tablelands. The soil best suited for the cultivation of tea is a light friable one of good depth through which water percolates freely, and here, again, Travancore is particularly suitable for the successful cultivation of the plant.

The tea estates in Travancore are mostly planted on jungle land. The first operation is to fell the forest. The felling is usually started in November or December, as the rains cease by then and dry weather may be expected until April. After the jungle growth has been cleared, and the branches of the larger trees lopped down, the burning down of the undergrowth is an operation requiring great care. A good clean burn depends largely on the proper dryness of the felled trees, the direction of the wind and the way the fire is applied. A bad burn, i. e., one where patches of jungle remain unburnt, means expensive clearing work, as a clearing can never be successfully burnt a second time. The clearing successfully burnt off, the next operation is to make roads. This would be a simple matter if the land is flat. But the tea estates in Travancore are all on the slopes of hills, the difference in elevation between the top and bottom fields of many gardens being well over a thousand feet. Roads, therefore, have to be cut out of the sides of the hills, following the numerous folds of the land, crossing many a mountain stream and working their way at a steady gradient up the hills by zigzags.

The road completed, lining and pegging is taken in hand. The object of this work is to mark out the position of each tea plant. Tea is usually planted 4 ft. by 4 ft. in

South India, and in straight lines up and down the slope of the hill to facilitate the operation of plucking the leaf when the plant eventually comes into bearing. A long rope, with pieces of red cloth let in between the strands every four feet, is pulled taut up and down the hill, and a gang of small boys then run along it and drive a peg firmly into the ground at each piece of red cloth. That completed, the rope is moved four feet to one side and the operation repeated until the whole field has been covered. A gang of men follow the coolies pegging the land, each armed with a small crowbar with which he digs a hole about eighteen inches deep by nine inches wide, and yet a third gang of women and children come behind, whose duty it is to scrap the best surface soil into these holes and trample it down firmly. The field is then ready for planting, but this cannot be started till the burst of the southwest monsoon. Water is an important requisite as the young plants want it for the first two or three months after planting.

The choice of seed and the preparation of the nursery in which it is to be laid down is a matter of anxious care on the part of the management. Many gardens both in North India and Ceylon make a business of putting a portion of the estate for the production of seed only. The purchase of seed is very much a case in which too great economy is a false policy, the cheapest being apt to turn out the most expensive. The appearance of the seed gives no indication of its variety; even in the nursery the young plants will pass muster except to the keenest and most experienced observer, and it is only after the bushes are well established in the field—when it is too late to correct the fault—that the bad quality of the seed is fully revealed.

Immediately on arrival at the estate, the tea seed is turned out of the boxes and put in beds to germinate. Meanwhile, the nursery beds are carefully dug over and marked out in size convenient for watering. The germinated seed is taken and planted four inches apart and the beds shaded

from the excessive heat of the sun. Tea is a hardy plant, and, provided the nursery can be relied on, the plants are ready to be transferred to the field from six to twelve months from the time the seed is put down in the nursery. It is not safe to count on getting more than 10,000 plants from a maund of seed. This is sufficient to plant $3\frac{1}{2}$ acres at 4 ft. by 4 ft.

With the breaking of the south west monsoon, all hands on the estate get busy, for, the earlier the planting is completed, the greater is the chance of a successful field of tea. If the plants have only been in the nurseries for six months or so, they are lifted with transplanters, which ensures that the roots are absolutely undisturbed. Older plants, whose stems have already turned to wood and are perhaps as thick as a pencil, will stand rougher treatment. These are pulled from the nurseries, care being taken not to damage the tap root. The stem is cut off to about four inches above ground level and then transplanted. This method is called stump planting, and in spite of the somewhat rough treatment they receive, it is surprising how soon the stumped plants throw out new shoots. The planting finished, the stumps or plants, as the case may be, are shaded, generally with bracken if available, after which that area requires no further attention except weeding, until the time comes with the burst of the next monsoon to fill in the gaps that have occurred through some of the plants dying. If these casualties do not prove to be more than five per cent., the planter can congratulate himself on his previous year's work. Meanwhile, another block of jungle will be felled and got ready for planting, and so the work goes until the whole estate is opened.

The tea bush in its natural state is a large shrub growing to a height of twenty to thirty feet, but this would not suit the planter who wants to get from it as large a quantity as possible of young tender leaves, so that from the start he sets out to train his tea to assume a low, bushy

habit. With this object in view he cuts the plants across at about six inches from the ground when they are about two years old and five to six feet high, and this has the effect of making them branch out low down. They are cut across again at a slightly higher level about eighteen months later, and with the new growth of leaf which this encourages, they come into bearing.

The all-important work of plucking now commences. This is essentially an occupation for women and children, and they very soon become adepts at it. The gang of pluckers, in charge of an overseer, each one armed with a fairly large basket tied either round the waist or hanging down the back, with a strap across the forehead, starts operations at the bottom of the field. The reason for planting the tea bushes in straight, continuous lines up and down the hill is now obvious, for each plucker is allotted a line, thus ensuring that every bush in the field is plucked. The system also has the advantage of enabling the Manager, Assistant or Overseer to immediately trace the culprit when bad work is discovered. It is adhered to in all field works in a tea estate and is a ready method of apportioning tasks and checking the amount of work done by individuals. The system of plucking generally adopted in Travancore is to nip off the young shoots just below the second leaf, so that each shoot taken consists of two young tender leaves and the terminal bud. The broad principle of plucking is to induce the bush to throw out more shoots. Care has, therefore, to be taken to leave always sufficient room on each shoot to enable it to throw out other shoots from the leaf axles, in each one of which a bud is formed. In Travancore, and indeed over the whole of South India and Ceylon, the tea "flushes", i.e., throws out new shoots all the year round, and regular rounds of plucking at intervals of eight to twelve days, according to the rapidity of growth, are carried out continuously from the time a field comes

into bearing. A good estate will yield well over 1,000 lbs. of prepared tea per acre. This means that the bushes have given four times that weight of leaf, as it takes four pounds of leaf to produce one pound of dried tea. Planted 4 ft. by 4 ft., there will be 2,722 bushes per acre, and a simple calculation will show that a yield of slightly over 1,000 lbs. of tea per acre means that each bush has contributed one pound and a half of young shoots during the year. When it is remembered that this process of removing the young shoot goes on year in and year out, it may be seen that the tea bush is wonderfully hardy.

At the end of three to four years from the time plucking is started according to the elevation at which the estate lies, the period lengthening in proportion to the increase in altitude, the field ceases to throw out new shoots in any number, and the time has then come to prune it again. In spite of the continual plucking, the bushes will by this time have succeeded in reaching a height of three to four feet, and pruning consists of cutting them across a few inches higher than the previous cut, the opportunity being taken to remove all whippy, knotted or ingrowing wood. In the process of pruning every leaf is removed, a pruned field showing nothing but bare frames. Very soon, however, the bushes throw out a new covering of leaves and the plucking process is then renewed.

Rubber.—In selecting the site of a plantation, virgin jungle with good soil and ground which is neither too steep nor too swampy is obtained where possible. The first operation consists in felling the jungle—in December or January—after which the fallen trees, etc., are burnt off and stakes put in to denote the spots where the rubber trees are to be planted. These are placed so as to give from 150 to 200 trees per acre. The staking done, roads are traced and cut and surface drains dug. The building of the lines and bungalows which are to permanently house the labour and the staff is also undertaken at the same time,

As regards the method of planting, enlightened opinion has latterly favoured the planting of seedlings at stake. However, even when this method is followed, it is advisable to have a nursery of young plants in reserve. It is recommended, therefore, to lay down a nursery of rubber seeds in the previous July and August so that plants may have grown sufficiently. Holes are dug, about 18 in. by 18 in., for the reception of the seed at stake or the young plants from the nursery. After these pits have been left to weather for a time, they are filled up with good top soil. Planting can proceed as soon as weather conditions permit. Where the rains are frequent, it is best, if possible, to start setting out the plants in the month of May, but planting operations may be continued from May to September which is the usual duration of the south west monsoon.

After completing the planting of a field there is a long waiting of six years before the trees are mature enough to be tapped. By this time they should have grown to the size large enough to permit tapping. During the period between planting and the first tapping of the trees, leguminous cover plants should be planted so as to prevent the top soil from being washed away. This is the time too when small terraces, e. g., stone walls a foot or so high and of the same width, are built for the same purpose.

Method of tapping--Probably in five years after planting, but surely in six years, the trees should be big enough to be tapped. The tapping methods adopted in Travancore have varied considerably, but all along the manner in which they have changed has tended to greater simplicity of method and to the reduction of the strain upon the trees. In 1910 and 1911, when the first big fields of rubber were tapped, most trees had three superimposed tapping cuts. In some estates the cuts extended to one-half of the perimeter of the stems. In the course of time the number of cuts were reduced to two, the two cuts eventually giving place, in 1915 or 1916, to a single cut per tree.

Strangely enough, it was found that over a long period just about the same quantity of rubber could be extracted from the tree, whether it was three cuts or one out. Very early in the history of tapping it was realised that the daily tapping of a tree by two or three cuts was too drastic, and when it became evident that under such a system the tree could not make good the wastage of bark in the period allowed for renewal, daily tapping by multiple cuts was abandoned by most estates, and the tapping was thereafter carried out on what is known as the "alternate day" system.

With the introduction of only one tapping cut per tree the daily tapping system came into vogue again, and it was continued down to the end of 1920 by the majority of estates in countries other than Ceylon. From then onwards, however, the necessity for reduction in expenditure, coupled with the poor bark-renewal on a daily cut, compelled most estate managers to adopt the less expensive alternate day system. With a few exceptions, this is the system now practised in Travancore, namely, one tapping cut per tree, on a half circumference, on alternate days. The Managers were more readily induced to adopt the alternate day system of tapping because of the increasing prevalence of what is known as "Brown Bast" disease, one of the symptoms of which is the cessation of latex production by the trees in the affected portions of the bark. The disease was believed to be caused by too frequent tapping. It has now been proved that daily tapping leads to two or three times as much "Brown Bast" as alternate day tapping. This fact is likely to prevent any return to a continuous daily tapping system.

Cattle play an important part in the agricultural economy of the State. Whether it be for
Agricultural stock. supplying manure, or for ploughing, or for raising water from wells, or for threshing grain, or for

carrying produce, or for working the primitive oil-mill, the cattle are the principal co-adjutors of the ryots. Apart from all these, cattle are greatly in demand as suppliers of milk and for purposes of the slaughter house. The number of cattle in Travancore has been steadily increasing during the last thirty five years. Besides the memorable survey taken by Messrs. Ward and Conner in 1816—1820, four systematic censuses of cattle have been taken. Messrs. Ward and Conner recorded that Travancore had then 3,82,360 heads of cattle and buffaloes and 27,360 sheep and goats. Cattle censuses were taken with the regular censuses of 1911, 1921 and 1931. In January 1935 a separate census of cattle was taken at the instance of the Department of Commercial Intelligence and Statistics (India). The results of these censuses are given below :—

Name	1911	1921	1931 (i)	1935 (ii)
Bulls	...	...	2,717	3,596
Bullocks	2,95,855	2,80,935	2,87,329	27,025
Cows	3,14,889	3,11,176	3,57,779	4,41,588
Young stock	1,95,304	2,09,786	3,15,969	3,55,564
Total Oxen	8,06,048	8,01,897	9,63,794	8,27,773

(i) Page 500, Travancore Census Report, 1931.

(ii) Cattle Census, Department of Commercial Intelligence and Statistics.

Name	1911	1921	1931	1935
Male buffaloes	60,627	60,769	57,259	26,192
Cow buffaloes	20,683	19,298	20,711	22,752
Young stock	12,533	11,439	15,179	11,437
Total buffaloes	93,843	91,506	93,149	60,381
Total bovine cattle	8,99,891	8,93,403	10,56,943	8,88,154

Sheep and Goats.

1911	...	...	2,05,471
1921	...	...	1,33,215
1931	...	...	2,50,160

The Census of 1935 did not record the number of sheep and goats. A more detailed account of the Census of 1935 is given below :—

Number of cattle (oxen and buffaloes) in Travancore as ascertained by the census held in January 1935.

		Totals for the State.
Cattle	Males	1. Breeding bulls, i. e., entire males over 3 years kept or used for breeding purposes. 3,596
		2. Working bullocks, i. e., bullocks and uncastrated males over 3 years kept for work only. 2,60,974
		3. Bulls and bullocks over 3 years not in use for breeding or work. 9,051
		4. Young stock (a) Under 1 year 59,362 (b) 1 to 3 years of age. 79,480
	Females	1. Breeding cows, i. e., cows over 3 years kept for breeding or milk production. 2,62,046
		2. Cows over 3 years used for work. 3,969
		3. Cows over 3 years not in use for work or breeding purposes. 1,75,573
		4. Young stock (a) Under 1 year. 1,08,432 (b) 1 to 3 years of age. 1,08,290

Number of cattle (oxen and buffaloes) in Travancore ascertained by the census held in January 1935 (*concluded*).

		Totals for the State.
Buffaloes	Males	
	1. Breeding bulls, i. e., entire males over 3 years kept or used for breeding purposes.	892
	2. Working bullocks, i. e., bullocks and uncastrated males over 3 years kept for work only.	53,728
	3. Bulls and bullocks over 3 years not in use for breeding or work.	1,572
	4. Young stock	
	(a) Under 1 year	1,714
	(b) 1 to 3 years of age.	2,799
	Females	
	1. Breeding cows, i. e., cows over 3 years kept for breeding or milk production.	10,671
	2. Cows over 3 years used for work.	6,337
	3. Cows over 3 years not in use for work or breeding purposes.	5,744
	4. Young stock	
	(a) Under 1 year	3,819
	(b) 1 to 3 years of age.	3,105

The above figures will show that the trend of production of the total bovine cattle is definitely upward. On comparing the figures obtained in the Census of 1931 with those of British India in respect of the number of cattle,

their proportion to the human population and the number maintained per one hundred acres of net sown area, it was found that the proportion of cattle and buffaloes to the population is very low and that Travancore compares favourably with the British Indian provinces in the matter of cattle maintained per one hundred acres of sown land. It has also been found that the number of cattle is too heavy a stock for the grazing that is available.

The cattle in Travancore hardly satisfy the demand. Roughly five to six thousand heads of cattle are imported every year to the State from Tinnevely, Coimbatore and Karachi for purposes of draught, slaughter and milk. Kumbham to Edavam are the months of maximum import, as the cattle are wanted for the plough during the cultivating season of the main paddy crop.

Breed and size—Travancore does not possess any special breed of cattle as its own. Authorities are inclined to label the Travancore cattle "Nondescript." But in common parlance the cattle are divided into different breeds according to the locality to which they belong. Of this the Vecchar breed is noted for its milking capacity. Latterly, attempts at improving the stock by cross breeding have created a mixed breed of cattle in the State. Recent calves owe their birth to Palirs from Ongole, Kangayam, Montgomery, Sind, etc.

The size of the cattle is extremely diminutive. Messrs. Ward and Conner described Travancore cattle as diminutive in size, small of build and poor workers. The local breeds are degenerate, small and wretched; their working power is very limited and their milk poor in quantity. Their colour is generally black; but brown animals are also found. They do not grow taller than some of the calves of the Nellore breed. "Climatic conditions, combined to a great extent with the ignorance and apathy peculiar to indigenous cattle

breeding and the usual anticastration attitude," have been responsible for the deterioration of the breeds.

Draught cattle. The draught cattle consist of bullocks and male buffaloes. These are used primarily for agricultural needs. Cattle are also used for town requirements. But the number actually serving the latter purpose is proportionately low. The number of draught cattle as per the last census was 3,26,217 and the number of carts 16,488. If a pair of animals is earmarked for every cart, the number that would be used for the towns would be 32,976. But at least 75 per cent. of the cart bullocks are also employed in agriculture. The actual number employed in agriculture is therefore 3,17,973 and the average area cultivated per pair of animals is 13·8 acres.*

Draught animals are used only for paddy lands. Ploughing of dry lands for other crops is only very rarely done. The area under paddy is 6,90,995 acres. The number of cattle, therefore, per one hundred acres of paddy lands is forty six. This percentage would show that the Travancore cultivator has more cattle than his brother in British India. The demand for draught cattle for agriculture is definitely seasonal. It coincides with the cultivation seasons. The price of ordinary oxen ranges from Rs. 50 to Rs. 80 per pair and that of buffaloes Rs. 100 to Rs. 120 per pair.

The number of cattle that are being used for carts annually is getting reduced. In 1933-34 the carts in use were 21,842, while in 1934-25 the number went down to 16,488. There is a definite downward trend in the demand for draught cattle for town requirements. This is mainly due to the increased motor traffic which is slowly replacing ox-driven carts. There is no special seasonal demand for

Net acres sown.	22,01,000.
No. of Cattle.	3,17,973.
Average.	13·8

this kind of cattle; the demand may be said to be generally spread throughout the year. The average price per pair of oxen comes to Rs. 240 and for a pair of bullocks of a lower grade Rs. 130.

Milch cattle -- There were 4,64,340 milch cattle in January 1935, of which 4,41,588 were cows and 22,752 she-buffaloes. Considered, therefore, on a population basis, the number of milch cattle per 1,000 of the population works out to 91. This is far below the average for British India, which is 197 per 1,000. At the same time the figure represents the number of milch cattle and not the number of cattle actually in milk. At the time of the census it was found that only 2,62,916 cows and 10,671 she-buffaloes were actually yielding milk, the remaining animals being dry. The total number of animals in milk was therefore only 2,72,717. This would again reduce the proportionate comparative figure to fifty three milking animals per 1,000 of the population in Travancore. The figure for British India is sixty six. The number of cows is greater than the number of she-buffaloes, due to the general prejudice against buffalo's milk indicated above. There is a large percentage of dry cows and she-buffaloes in the State due to bad management and belated mating. The demand for milch cattle is general throughout the year except in towns like Trivandrum where with the annual summer recess one notes a sharp decline in the demand for milk.

The principal factor which counts in the determination of the price of the milch cattle is the milk yield. In estimating the price, only the milk drawn in the morning is taken into account, the cost of the evening milk being reckoned as the price of the animal's maintenance for the day. The "nāli", the measure used for milk, is equal to 12 oz. In determining the price of a cow, a nāli yield of milk is ordinarily valued at six to eight rupees. A cow fetches its best price during its third lactation, the price

beginning to fall with the fourth. The sex of the calf is not ordinarily a point of consideration in the purchase of a cow, but a female calf is preferred. The average price of a cow in 1925 was Rs. 69. The price is falling. This price is for the local variety. A Scindhi cow costs on an average Rs. 260.

The price of a she-buffalo is slightly higher than that of a cow. The price is based on the milk yield. A "nāli" milk yield is priced at seven to ten rupees. The milk is in greater demand in the tea-shops. There is a heavy percentage of mortality among the buffalo calves.

Cattle for slaughter house:—Meat eating is not yet a national habit; but the percentage of the population inclined to a non-vegetarian diet is large and definitely on the increase. The annual demand for cattle for the slaughter house is estimated to range between 18,000 and 20,000. Oxen are generally slaughtered. The cow is held to be a sacred animal. Buffaloes too are killed. But owing to the disinclination of the people to buffalo meat the slaughtered number hardly comes to five per cent. of the total. The seasonal demands cannot be correctly gauged, but still it is thought that the demand for slaughter animals is greater when fish is scarce. The season of higher demands has been fixed to December-January and July. Ninety five per cent. of the slaughter animals consist of those that are useless for milk or draught purposes. The butchers buy slaughter animals at nominal prices which range from five to fifteen rupees.

The improvement of cattle is a vital problem in Travancore. Agricultural prosperity depends to a great extent on the betterment and efficiency of the cattle. The cattle problem turns round a vicious circle of want of good feed and want of good breed. Even at the time of the survey of Messrs. Ward & Conner, the cattle were small in stature. The climatic conditions are unfavourable for the rearing of good cattle. The heavy rainfall and the comparative poverty

and insufficiency of pasture lands are particularly unsuited to the breeding of good cattle. Though the country gets both the monsoons and there is an abundance of pasture during the rainy seasons, the fact that the rains are not spread throughout the year creates a dry season when it is not possible to raise any kind of pasture. During the rainy season the rains pour so heavily and continuously that it is impossible for the cattle to graze in the open. Thus feeding is a difficult problem in both the dry and the wet seasons. The stock also is very poor. The degeneration of the local cattle is due to promiscuous mating and improper and insufficient feeding. The Agricultural Department has been trying to solve the problem. A cattle farm was opened at Trivandrum as early as 1085. Observations at the farm showed that any process of selection and breeding will not meet the demand and that foreign breeds had to be introduced to grade them up. The department therefore experimented with bulls from the adjoining British Indian districts and Indian States. The Ongoles, the Kangayam and the Amrit Mahals were among the first batch of foreign breeds to be tried. The results were not satisfactory. Bulls from Upper Indian breeds like the Scindhi as well as English cross breeds were then imported and tested. The Scindhi breed was found to adapt itself to local conditions. Efforts were therefore made to popularise the Scindhi cattle. Herds of selected bulls and cows were imported from Karachi and maintained at the Government Farm. Calves born to them, when weaned, were sold generally in pairs to individuals and institutions interested in cattle breeding. Complete extermination of the whole stock of local cattle was not possible. It was therefore thought that more extensive results could be obtained quickly and cheaply, though less perfectly, by grading up the local cows with bulls of superior strains. The number of bulls in the country is far too few to serve the existing stock of cows. Hence the large number of dry cows in the State. The Agricultural Department therefore

persuaded the ryots to reserve for breeding purposes the best among the local bulls. To encourage this practice the department introduced a system of issuing grants for their maintenance. Besides striving for improvement by selection and breeding, the department also attempted to provide a sufficiency of good feeds. The various experiments they conducted with regard to the fodder crops have been detailed elsewhere.

Goats and sheep. Goats are not rare. They are generally reared by poor people near the towns, not so much for manure as for their flesh. In rural places, especially in South Travancore, they are generally kept for manuring purposes. They are also kept for milk, as it is considered to possess many medicinal properties. A goat lives here for ten years at the most. Its price ranges from two to five rupees. Sheep are commoner but not abundant.

Horses and asses. Horses are exotics and the ass is a rarity except in South Travancore. There is, however, a species of the ass, resembling the horse, along the frontier at Aramboly. They are good draught animals. The asses are mostly used by the washermen to carry their heavy wador. They are not found in North Travancore.

Cattle diseases and their control—The need for veterinary relief was recognised by the State as early as 1062, i. e., about fifty years ago, when it was felt by the Government that no effective advance in agriculture was possible without conserving the general health of the cattle and other livestock which formed the mainstay of the agriculturist. A veterinary hospital for the State was sanctioned and it was located at Trivandrum. It functioned as a solitary institution under direct government control for over twenty years till 1083, when its management was transferred to the Department of Agriculture newly organised. Its usefulness was greatly appreciated by the agriculturists and as a result more hospitals were gradually set up. At present there are fifteen such hospitals distributed all over the State, and these are in charge of duly qualified Veterinary

Inspectors with the exception of two run by compounders. A Veterinary Superintendent was appointed in the year 1099 to assist the Director of Agriculture in effectively guiding and co-ordinating the work of the veterinary officers. These hospitals have proved a boon to the agriculturists and other cattle owners and have been working quite efficiently all along, but their number is admittedly quite inadequate to the needs of the State to-day. Further, the Government recognised the importance of the native veterinary science and extended their patronage by grants-in-aid to four Āyurvēdic physicians. Besides, grants are awarded to a veterinary graduate and to another private veterinary practitioner.

Diseases: Contagious and non-contagious. Their treatment—Cattle diseases may be classified under two heads, viz., diseases of a contagious character and those of a non-contagious nature. Ordinarily, non-contagious diseases are treated in the veterinary hospitals and dispensaries. Veterinary inspectors visit the scenes of out-breaks of contagious diseases, camp at the places of out-break and render the necessary veterinary aid for the patients infected with contagious diseases. Cattle are treated free of any charge whatever in the hospitals and dispensaries, though other animals which serve for luxury, such as horses and ponies, and domestic pets like dogs, cats, etc., are charged for. Charges are also levied for the treatment of elephants which are generally owned by rich men. The admissions into hospitals of cases of diseases of a non-contagious character are steadily increasing year after year, and the total for the last twelve years comes to 2,55,570, which works out at an average of 21,280 cases per year. During the period 10,571 castrations have been performed and 23,044 other surgical cases attended to. This steady increase conclusively shows that the institutions are becoming popular day by day.

Contagious diseases. Of the contagious diseases, Rinderpest, Foot and Mouth, Hæmorrhagic Septicaemia, Anthrax, Black Quarter and Rabies are of the most frequent and wide-spread occurrence in Travancore. There has, however, been a reduction of mortality among the animals affected since 1999 M. E., due to the protective and preventive inoculations started by the department.

Control. Inoculation and segregation form the chief means of control and the veterinary officers are doing their best in this direction.

Though in general the fisheries of the tropics do not compare favourably with those of the temperate and frigid zones, Travancore stands as an exception
* Fisheries.* to the rule. This is due to the position of the "Wadgar Bank", the richest fishing ground in the Indian Ocean, near the coast of Travancore. The backwaters and other inland waters are also rich and, with proper conservation, their continuity is assured.

Till recently fishing in the backwaters was indiscriminate and destructive. The Government considered it necessary to restrict fishing in the backwaters so that the fisheries might not be depleted. For this purpose the Fisheries Department was started towards the end of 1089. Two Fishery Inspectors were appointed that year and soon after they were deputed for training to the Madras Fisheries Department, under Sir Frederick Nicholson. They returned after training by the end of 1090. One of them was put in charge of the duties connected with the organisation and control of the backwater and inland fisheries and was designated Inspector of Fisheries, while the other was put in charge of fish industries, to handle problems relating to the preservation of fish by such processes

* For details relating to yield, varieties and kindred information, see chapter XIX on Fisheries.

as curing, pickling, etc. The Inspector of Fisheries was for some time engaged in studying the conditions of the backwaters, inland fisheries and of the fishermen engaged in inland and backwater fishing, while the Inspector of Fish Industries studied the conditions of sea fishing, curing operations and coastal fish trade. Fishing in the backwaters was regulated by the application of the Game and Fish Protection Regulation XII of 1089, by which no one was allowed to fish in the backwaters except under a license for which a fee was levied. The implements used can be classified as free fishing implements and fixed engines such as stake nets and Chinese nets. The free fishing implements are Kola vala, Vicchuvala, Mañivala, Nañimñivala, Kaṇḍalivala, Soravuvala, Koratṭuvala, Peruvala, Othukkuvala, Oṭṭuvala and several other nets that are taken from place to place in small canoes or without canoes. The fee levied on these as well as stake and Chinese nets depended upon the nature and dimensions of the nets used. Subsequently the Regulation mentioned above was not found to be efficient. The Travancore Fisheries Regulation XI was accordingly enacted in 1097. This was made so comprehensive that the lime shell and chank fisheries of the State were also brought within its scope.

The scheduled areas over which the Regulation is applicable are the major backwaters of Aṣṭamuḍi, Kāyamkuḷam and Vēmpanāḍ. Fishing in these is controlled directly by the Fishery authorities, while the right of fishing in the inland waters, such as rivers, minor backwaters tanks, etc., is leased out periodically. Free net fishing is permitted in the scheduled and leased waters, while fishing by stake nets and Chinese nets is permitted only in the scheduled waters. At the time of the inception of the department, stake and Chinese net fishing was in vogue only in the Vēmpanāḍ Lake. The fixed engines gradually spread in the Aṣṭamuḍi and the Kāyamkuḷam backwaters.

Stake nets were from ages past the wealth of the Vāla community. In the interest of that community which is backward socially and economically provision has been made in the rules published under the Fisheries Regulation for stake net fishing in the Vēmpañād Lake being made the sole monopoly of the Vāla community. The numbers of Chinese nets and stake nets have considerably increased and their further registry is being strictly regulated to prevent the depletion of the backwaters. As a result of this, the revenue derived by the issue of licenses for the various implements used rose considerably. To cope with the increasing work, three more Fishery Sub-Inspectors were appointed and put in charge of controlling and conserving the inland fisheries.

In 1093 the fish curing yard at Muṭṭam was transferred from the Excise Department to this department and placed under the control of a Fishery Sub-Inspector. There was demand for the opening of more fish curing yards on the coastal areas. From time to time this demand has been met wherever it was possible. There are at present twelve yards, seven in the southern fishery division, three in the central division and two in the northern division. Now nearly 70,000 maunds of fish valued at nearly seven lakhs of rupees are annually being cured in all the fish curing yards of the State. It is observed that at places where there are fish curing yards, the price of fresh fish increases by thirty per cent. Thus the actual catcher of fish benefits on account of the presence of the yard by two lakhs of rupees and this at the cost of the middlemen. The total quantity of fish cured in all the curing yards from the beginning of the department is more than six lakhs of maunds of fish valued at more than Rs. 61 lakhs. The savings obtained by fishermen in all the villages where the yards are situated are eighteen lakhs of rupees, which otherwise would have gone into the pockets of the middlemen. There is demand for more curing yards. Large

quantities of various varieties of fish are, during heavy fishing seasons, wasted as they cannot be sold raw.

Fishing Gears:—In 1093 three fishermen, two from Trivandrum and one from Alleppey, were deputed at government cost to Baipur for training in deep sea fishing. Two sardine nets were purchased in 1091. One was given to the Añayas in Cheriañikkal and the other to the Añaya Co-operative Society in Alleppey. They were tried and found to be useful. The costliness of the nets and the conservatism of the fishermen stood in the way of their taking to the permanent use of this type of nets. Another type of implement introduced for sea fishing was the long line. The sea faring fishermen in Travancore were never familiar with this. The long line is used rather far out in the sea. Fishermen from Calicut and other places in Malabar were got down and made to fish in the seas near Niñdakañña, and Cheriañikkal, so that the local fishermen might take lessons from them. The local fishermen have not become fully conversant with the use of this apparatus, but they recognise its utility in the matter of capturing fish. Consequently the fishermen of Quilon and Kañunāgappally get down every year scores of master fishermen from Ponnāni and other places for the operation of the long lines. The fishermen over here heartily co-operate with them and it is expected that before long the fishermen of Travancore may become bold enough to go into the sea with long lines.

Piscicultural operations—Fish breeding ponds were constructed at Kuñipula near the Agricultural Office in Quilon. Several varieties of economic fishes were planted there for experiments and observations. The life history of the *Eetroplus suretensis* and *Eetroplus maculatus*, certain species of mullets, the milk fish, the chempolli and cat fish were found to be suited for stocking fresh water ponds. As an experimental measure four of the municipal tanks in Quilon were stocked with breeders mostly of *Eetroplus suretensis* and

fry of Chempolli and cat fishes. *Suretensis* and cat fishes multiplied enormously, while the fry of Chempolli grew well. The experiment was extended to a tank fed by the little spring at Śivanellur in Shenkōṭṭa. *Eetroplus suretensis* could thrive well in perennial fresh water tanks situated even far away from the sea. To artificially hatch out mullet, an experiment was made in the observation station at Nīṇḍakaṛa near the bar zone. It was found possible to successfully hatch the mullet roes artificially.

A prawn breeding farm was opened at Āyirānthengu in 1094 with the object of demonstrating to the fisher-folk the possibility of cultivating prawns in small enclosed areas. The habits of the common varieties of prawns were observed. It was found that the common Naran grew well and that the chief precaution to be taken was that the area of water selected should be at least $2\frac{1}{2}$ feet deep so that the bottom layer of water does not get heated. With proper sluice arrangements to control the ingress and egress of water, an amount of Rs. 30 to 35 could be obtained from an acre of water.

Details regarding the early stages in the life history of black clams were gathered and it was observed from the study that the motion of water through waves adversely affected the growth of the shell in such stages.

Experiments in curing—Several experiments on the curing of different varieties of fish were conducted. In most places in Travancore the pit system of curing was in vogue. Through the efforts of the departmental staff the pit system is giving place to the more hygienic "tub system". Certain curing experiments were conducted in regard to prawns with and without salt. As a result thereof it is found that three to eight per cent. of salt added during the preparation of prawns keeps the stuff in good condition for four to five months, while a further increase of salt tends to deteriorate the cured product if the moisture conditions are normal.

During curing operations large quantities of brine were thrown away, as they were supposed to be unfit to be used again. It was engaging the attention of the department how such large quantities of brine containing nearly 16,000 maunds of salt thrown away annually, could be rendered useful for re-use. It was found out that by boiling and coagulating the animal matter suspended in the brine and thereafter filtering it, the brine could be re-used after bringing it to the standard strength. During this operation all the vegetative cells including the pathogenic organisms are killed. It was also found out that for recovering one maund of salt the cost involved is only three chuckrams. The experiment has been conducted on the line proposed by Horden F. Taylor, the Chief Technologist in the Bureau of Fisheries in the U. S. A.

The study of the decomposition of sea bream was undertaken and the results obtained were found to be of practical usefulness in the curing of this fish.

Kenching—In fish seasons, when the fishermen get very heavy hauls which they are unable to dispose of or treat in the proper manner due to want of labourers or salt or for any other reasons, it was the practice to convert valuable fishes into manure. The loss incurred by fishermen is sometimes considerable. Hence the process known as kenching, which is prevalent in Europe, America and Japan, has been resorted to for saving a lot of edible fish. The system was first introduced in Colachel. It is gradually getting popular.

An experiment was started on the pickling of fish in “korukappuly” instead of vinegar and the results obtained were satisfactory. At the instance of the Fishery Inspector who carried out the experiment Mr. V. C. Fernandez, a leading fish merchant at Pānthurai near Trivandrum, prepared twenty-eight barrels of fish by the above process and the same were sent to Ceylon, where they found a ready market.

The study of the preservation of the sea cucumber was conducted and encouraging results were obtained. Endeavours are being made to popularise this as an edible commodity as is being done in the U. S. A.

Some interesting experiments were conducted on the extraction of liver oils, utilisation of skins of big fishes like sharks, skates and rays for the manufacture of articles of common use, such as shoes, hand bags, etc., and the results obtained were quite encouraging.

Education among fishermen—The first fishery school was started in 1093 at Pāṇāvally. The necessity for giving vocational education and some knowledge in reading and writing was felt because education alone, though in an elementary manner, was found to be the means to remove many of the evils prevalent among the fishermen and to initiate them into the habits of thrift and economy. Three more schools were later on started at Kōthavara, Arūr, and Munampam. Weaving, net making, account keeping, curing of fish, etc., besides some elementary education, are taught in these schools.

Socio economic work among fishermen—In 1093 the first attempt to spread the co-operative movement among the Vālas was started, and the first Vāla co-operative society was registered in that year. There are now forty two Vāla co-operative societies. It is evident from this that the co-operative movement has taken deep root among the Vāla community. Nearly ninety five per cent. of the adult population of the community are members of Vāla co-operative societies. There are very few among the Vālas who do not know something about the working of a co-operative society.

The Vāla co-operative societies were hitherto concerning themselves with credit activities only, Society No. 256 at Arūr in Shērthala started the sale of dried prawns on a co-operative basis. The average sale price for a candy of dried prawn was Rs. 135 when the society effected the sale

directly, whereas the price offered by the middlemen was only Rs. 80 per candy. This proved beyond any doubt that co-operative sale was the best method to obtain the full benefits of their labours and to gain relief from the clutches of the middlemen. Society No. 1951 of Mukkam in the same locality also started the sale of prawns on co-operative lines. It has been proved to the Vālas that the collection and sale of dried prawns through their own co-operative societies instead of through the middlemen is more profitable. Regular propaganda is being carried on to bring home to the Vālas the ruinous course of perpetual dependence on the middlemen and the economic advantages of selling their dried stuff on a co-operative basis through the guidance of the department. The lion's share of the price of dried stuff obtained in Rangoon is knocked off by the middlemen in Cochin, Alleppey and Rangoon and their agents. Only less than half the price of the prawns is left for the actual catcher. This is a hard case. The present attempt is to do away with the middlemen and agents in Cochin at least, so that what is pocketed by them may go to the real labourer. It is estimated that he will realise at least twenty five per cent. more than what he now gets by way of price. Lakhs of rupees worth of dried prawns are now being exported to Rangoon annually. Arrangements are afoot, therefore, to register a central depot with a capital of Rs. 25,000 in Arūr Mukkam for the collection and sale of dried prawns. Every Vāla co-operative society will be affiliated to it. The produce collected from the members of each society will be gathered in the central depot, which will sell the whole lot directly in Rangoon, thereby saving all the middlemen's commission, etc.

Bee-keeping is a cottage industry well suited to Travancore conditions. It is taken up as a hobby by several people in Trivandrum and in mofussil parts. As a subsidiary occupation Apiculture

Apiculture.

is of great promise in Travancore. It is a useful occupation and can be introduced as a cottage industry. The Agricultural Department has been instrumental in introducing Apiculture in several homes in the towns of Nāgercōil, Trivandrum, Quilon and Alleppey, in villages in the southern and central parts of the State and also in some European estates in the High Ranges. To educate the people in the art of bee-keeping and to foster the development of the industry, there is an Apicultural Section attached to the department.

The Assistant in charge of the section keeps a model apiary at Trivandrum, maintains for sale a stock of bee-hives and other equipments, inspects private apiaries in the Trivandrum town and its suburbs and carries on propaganda in the mofussil. The Apicultural Assistant is engaged in popularising the industry and demonstrating the use of modern methods and appliances. The industry of bee-keeping was sanctioned from the 1st Chingam 1094 and a Bee Expert was appointed for one year. Actual work was, however, begun only by Thulām 1094. The first experiment in bee-keeping was demonstrated at Neḍumangād where there are large colonies of bees. The experiment was subsequently expanded to Trivandrum and Neyyāttiṅkāra. Bee logs were placed on suitable trees in these places. More than a dozen hives were reported to be full and in working condition. New methods of extracting honey without causing injury to the bees were demonstrated to the people. Orders were passed during the year sanctioning an experimental class consisting of eight pupils with a full course of instruction in bee culture extending for one year being started from the 1st Chingam 1095 at Neḍumangād and also a grant of Rs. 12 to each pupil who comes out successful at the end of the course, to enable him to purchase a complete set of apparatus. Experiments were made with regard to the domestication of the various species of bees existing in Travancore, which

showed that two varieties could be domesticated. Proper hives on new models were constructed for keeping them. To put the industry on a firm basis, the apiary was removed to Trivandrum in 1095 and a central place was selected for building a model apiary for purposes of demonstration. The Trivandrum apiary is fully equipped with all modern appliances and is open every day. An apicultural class was started at the beginning of the year. The course extended over six months, at the end of which each pupil was given a hive and the necessary tools. After a further period of two months the pupils were visited in their homes and additional instruction imparted to them. Several persons who did not actually attend the above classes were also given instruction in bee-keeping, many of whom after training took up the industry. The industry bids fair to become popular with the upper class of the population. There is a considerable demand for instruction in bee-keeping from North Travancore. Hill-men engaged in the extraction of honey were taught to extract pure honey without destroying the brood and burning the bees down. The supply of honey in the Trivandrum apiary was not adequate to the demands made on it, and during the short period of its existence, many private apiaries have been started in Travancore.

The Apicultural branch was made permanent in 1096 and was amalgamated with the office of the Director of Industries towards the close of the year. The Apicultural Assistant was directed to attend to both demonstration and propaganda work in the villages. The people were shown the advantages of improved methods of bee-keeping. The collection of wild honey was given up in 1096. Standard hives were made and sold to the public at cost price. Fifty such hives were made during the year 1100 and they found a ready sale in Trivandrum.

The Apicultural Assistant visited several villages with a view to popularise the industry among the villagers.

Bee-keeping is being taken up as a hobby by several people in Trivandrum and in the mofussil parts. The department is supplying hives and swarms of bees to the public at cost price and is rendering them every assistance to carry on successfully this useful subsidiary occupation.

The Apicultural Assistant visited a number of villagers and carried on propaganda to popularise bee-keeping as a spare time occupation among the cultivators. The Y. M. C. A. at Mārthāṇḍam is co-operating with the department in introducing bee-keeping as a cottage industry among the villagers. A private gentleman who has been keeping bees on a scientific basis for the past nine years reports that with an initial expenditure of Rs. 5 to Rs. 6 on a hive and a swarm of bees he is able to collect about two bottles of honey per annum, which he sells at Rs. 3 per bottle. The Apicultural Assistant is carrying out experiments in domesticating foreign bees in collaboration with the Y. M. C. A. in whose behalf Dr. D. S. Hatch has imported some colonies of Italian bees. He is further corresponding with the bee-keepers in Australia for the importation of Australian breeds.

A stock of bee hives, honey extractors and other appliances are kept for sale by the Apicultural Assistant. Two cheap models of honey extractors were designed and instructions given to the public for the manufacture of these equipments. Practical training in bee-keeping is given to students and written instructions issued to enquiries from various parts in and outside the State.

A Poultry Expert was appointed in 1095 and a Poultry Farm opened in Trivandrum in 1096. Foreign breeds and crosses between foreign and local breeds are being reared with a view to select the best out of them for distribution. Every attempt was made by the Agricultural Department to popularise poultry-farming as a cottage industry and two co-operative poultry societies were organised during 1098, one in Trivandrum

and the other in South Travancore. Experiments at the Poultry Farm proved that the crosses between Orpingtons and local hens produce high class birds. Special efforts were made through individuals and co-operative societies to spread foreign breeds in the country. Two new co-operative societies for poultry farming and egg marketing were started in 1101. The people all over the country have begun to appreciate the value of poultry as a source of subsidiary income and of food production, and there has been of late a very substantial increase in the number of poultry keepers in the State. Foreign breeds of fowls are reared in the Poultry Farm in Trivandrum. Experiments on the mating of local hens with cocks of foreign breed is being continued. The Poultry Assistant visits important villages and gives advice and assistance to several persons interested in this industry. From the Poultry Farm over 10,300 eggs and 206 chicks of superior breeds of birds like White Leghorn, white Wyandotte and Rhode Island Reds have been distributed to the public during the past 15 years. Poultry farming is becoming more and more popular.

A Silk Farm of seven acres was opened on the 29th Chingam 1086 in Trivandrum. Four acres were planted with Bangalore mulberry and Travancore mulberry. The rearing of silk worms, the reeling of cocoons and the weaving of silk yarn were experimented upon and found to be successful. Sericulture caught the imagination of the people rapidly. The Manager of the farm was deputed to Bangalore to get the necessary seed cocoons. The seed cocoons solicited by the Manager were tried and found to be successful. Twenty five Eri seed cocoons were got down from the Agricultural College, Coimbatore, in 1087. The rearing of the Eri silk worms was found to be easier than that of the mulberry silk worms. The silk yarn, produced at the Farm, was found to be of good quality. Seeds of Bengal, Mysore and French varieties

were introduced in 1088. Facilities were given to start sericulture as a cottage industry. Eri cocoon is reared in several places in Central Travancore. Another Farm was opened later at Thiruvalla and a school for teaching sericulture was started under the auspices of the Salvation Army in Trivandrum. Though sericulture seemed to be prospering for some time, it was soon found that the climatic conditions of Travancore are not ideally favourable to the success of this industry. The Silk Farm was made permanent in 1088. But there is no doubt that as a subsidiary occupation the poorer classes will find it a useful means of supplementing the income they now derive from their main occupation. It is only a poor man's industry.

The Silk Farm in Trivandrum was closed in 1107 as a measure of retrenchment. Sericulture has received a set back with the closing of the Farm. It is even now being tried in a very small scale in different parts of Travancore as a cottage industry.

In Travancore the foundations of agricultural education were laid as early as 1895, when during the administration of the late Dewan Śankarāsubbier an attempt was made to impart agricultural education to a few young men of the farming classes in the Demonstration Farm, Trivandrum. But the work then begun could not be continued for long, as the school did not survive the period of his Dewanship. During the time of Dr. Mitchell, Director of Public Instruction, the Government desired to give an agricultural bias to the education in the Malayālam schools and accordingly Agriculture was included as an optional subject in the curricula of studies for the V, VI, and VII classes of such schools in the State. The subject still continues to be taught in these schools, but the desired improvement has not been achieved, as the teaching is mostly theoretical from book-lore alone.

Agricultural education and agricultural colonies.

In 1918, the Government decided that definite steps be taken towards the introduction of Agriculture in the State, and in 1921 the first agricultural middle school was opened at Alwaye where the public had offered to construct a school building for the purpose. The work was begun from May of that year. Following the opening of the agricultural middle school at Alwaye and in consideration of the success and popularity of the institution, two more schools were opened, one at Kottāṛakara in 1928 and the other at Kōnni in 1931. The staff sanctioned for each of these schools consisted of a Headmaster (Inspector's grade) an assistant teacher (Sub-Inspector's grade), a maistry to supervise the field work, and a carpenter and a smith to teach the students carpentry and smithery. There were farms attached to the schools, the Alwaye school having a farm nearly twelve acres in extent, the Kottāṛakara school having one nearly seventy five acres and the Kōnni school one about twenty seven acres. In 1932 the Alwaye agricultural middle school was abolished owing to the unsuitability of the station for running the school. The other two schools are still running.

Training Facilities — To popularise this new type of education among the masses and to attract more young men of the cultivating classes, a liberal award of stipends was instituted in these schools. There were twenty students in the Kottāṛakara school and thirty at Kōnni getting these stipends. The teaching in the schools is free throughout. The schools are also provided with a hostel each and a cooking establishment at government cost, and the students' residence in the hostel is made compulsory.

Courses of Training. The course of instruction in these schools runs over two years and the medium of instruction is Malayālam, the local language. The selection of boys for admission is made only once every two years after a previous batch has been trained and sent out. The minimum qualification prescribed for admission is either a certificate

of pass in the V. S. L. C. Examination or a certificate of having read up to the III form in an English school. The instruction includes lectures in the class room daily for three hours on such subjects as Agriculture, Botany, Agricultural Chemistry, Entomology, Agricultural Mathematics, Plant Diseases, Cattle Breeding, Co-operation and Rural Development, and also practical training in the field for three hours daily in various agricultural operations, in the use of the improved implements of tillage as well as in Irrigation, Surveying of land, Control of Plant Diseases, Plant Pests, etc. Facilities have been provided for teaching the students carpentry and smithery so that they may be able to repair and make the ordinary farm implements. In the Field Training Section, the students are also given a small block of land—each ten cents—every year, where they are expected to raise one or two seasonal crops by their own labour and at their own cost. From the year 1930, provision has also been made for the engagement of the students to work in the farms attached to the schools, during their leisure hours on wages, so that their income from the stipends might be augmented and their stay at the schools made self-supporting. Periodical excursions are also arranged at government cost and the students are taken to visit most of the important agricultural stations and other places of agricultural interest in Travancore, Cochin and Malabar and to study the prevalent agricultural practices and improvements there. After two years' training, the students are examined by a Board of Examiners appointed by the Director of Agriculture and consisting of experts and the Headmaster of the school. The successful candidates are awarded a diploma of pass by the Director.

In the subjoined statement is shown the number of students who have been trained in the three agricultural middle schools :—

Name of school	Details	Batch Nos.					Total
		1	2	3	4	5	
Agricultural school, Alwaye	No. of applicants	100	30	24	22	22	198
	No. admitted	32	16	16	20	21	105
	No. successful	27	12	12	13	15	79
Agricultural school, Kottāṛakara	No. of applicants	62	63	89	78	22	314
	No. admitted	34	31	29	20	20	134
	No. successful	24	27	18	14	...	83
Agricultural school, Kōnni	No. of applicants	130	70	32	...	...	232
	No. admitted	52	32	31	...	...	115
	No. successful	48	21	...	...	...	68

The fifth batch in Kottāṛakara and the third in Kōnni are at present undergoing training in the schools. As may be seen from the above, more than three hundred students have been trained in all the schools together, and of these 200 have obtained the diploma issued by the department.

The sole aim and object of the Government in starting the various agricultural schools was that a sufficient number of trained young men of the agricultural classes should go back to the land, where with their superior knowledge of the science and technique of modern agricultural practices they would not only improve the cultivation methods in their own lands, but would also serve to spread such knowledge among the other agriculturists' roundabouts by their example and advice. But soon after the opening of the agricultural middle school at Alwaye, the Government realised that if the aim of the education was not to be defeated, the pupils of these schools should be turned away from the goal of Government Service and other professional careers and induced to return to the land. With this object in view, a system of colonising the students in lands set apart by the Government was inaugurated in the year 1926. Three hundred acres of land from the Agricultural

Farm, Kōnni, were set apart and divided into blocks of ten acres each and assigned on certain concessional terms to the successful students of the schools. The Government was pleased to sanction to each of the students a loan of Rs. 500 on special easy terms of repayment, for meeting their preliminary expenses to bring the lands to condition. Twenty four students, twenty from the Alwaye agricultural school, and four from the Kottārakāṇa agricultural school, have occupied twenty four such blocks. The colonies are under the guidance and control of an experienced officer of the department and have been so far successfully worked. Each colonist is asked to reside in the area and bring under cultivation not less than five acres by the third year, seven acres by the fourth year and all the ten acres by the fifth year. No tax or rent is levied on the land for the first three years, but thereafter a rental of one rupee per acre of cultivated land is realised from the colonists. The government loan of Rs. 500 advanced to the colonists for improving the land is to be repaid in ten equal annual instalments, the first instalment to begin three years after disbursement. The land is first given on lease but after the government loan and other dues are repaid it will be registered in the names of the colonists on a ground value of Rs. 25 per acre.

The colonists have raised perennial commercial crops, such as coconuts, rubber, coffee, pepper, arcanuts, etc., as also annual and seasonal food crops like paddy, tapioca, bananas and other root crops. Though the slump in the prices of all agricultural products has hit the colonists hard, the progress of the colony has been satisfactory and affords striking testimony to the value of such concerted planning.

A co-operative society has been organised among the students of the agricultural school, Kōnni, and this society has been helping the remaining unemployed students to secure work in estates of the landed gentry or under other

agencies. The society has also tried to secure more lands for assignment to the student members thereof on a co-operative model, and in 1935 the Government was pleased to sanction the assignment of another 165 acres of land to the society for distribution among the members at five acres per head.

The schools and the colony for some of the students have been worked so far in such a manner as to popularise the adoption of improved forms of cultivation, the use of modern implements, etc., as also to demonstrate the possibility of successful cultivation of land on a collective and co-operative basis. It is hoped that with the further progress of these institutions, a greater fillip would be given to the revival of the agricultural industry of the State.

With a view to develop marketing facilities for agricultural produce in India, a comprehensive All-India Marketing Scheme was inaugurated by the Imperial Council of Agricultural Research in India with effect from the 1st January 1935. Travancore was invited to co-operate with this scheme. Accordingly, a staff of two Marketing Officers was appointed under the Director of Agriculture and Fisheries but to work under the technical guidance of the Agricultural Marketing Advisor to the Government of India. The first work assigned to these Marketing Officers was a survey of the markets and marketing practices with reference to particular commodities of all India importance. These surveys were intended to produce a clear picture of the existing facilities so that their defects might be easily noted and developments wisely planned. The commodities selected for the survey during the first year included, rice, wheat, ground nuts, linseed, grapes banana, pine apples, cattle, sheep and goats' milk, ghee and butter, eggs, wool, hair and hides and skins. A survey of fairs, markets and

Agricultural
marketing.

produce exchanges was also included in the programme for the first year. One of the Marketing Officers devotes his attention to livestock products and the other to crops. The question of establishing organised markets in Travancore was referred to the former for a detailed report. For this purpose as well as for the preparation of the markets, fairs and produce exchanges he visited thirty-nine markets in the State and made a careful study of the practices obtaining there, the weights and measures used, the charge levied, the facilities provided and the market intelligence available at each place. A scheme for developing marketing facilities for each commodity will be devised only after the compilation by the Central Marketing Staff of an All-India Report for that commodity based on the Provincial and State reports. The earliest of the Travancore reports to be completed was that on eggs. The survey revealed the possibilities for developing the industry and, as a first step, a Gardening and Packing Station was established at Quilon with the Central Marketing Staff in Delhi. The aim of this station is to demonstrate to the traders the merits of graded egg sales and the advantages of improved types of packages.

On the recommendation of a conference of the officers of the Department of Agriculture and Fisheries, held at Quilon in Minam 1110, the Government constituted a Board of Agriculture in Travancore in 1111. It consists of official and non-official members. The Director of Agriculture and Fisheries is the President *ex-officio* and the other official members consist of the Research Officers, the Marketing Officers, the Fishery Superintendent, the Veterinary Superintendent, the Headmasters of agricultural schools and the Agricultural, Veterinary and Fishery Inspectors. There are seventeen non-official members, five from the Śrī Mūlam Assembly elected by that body, five from the Śrī Chithira State Council elected by that body, and the rest nominated by

The Board of
Agriculture.

Government. The nominated members hold office for a period of four years from the date of their nomination and the elected members for the period of the Assembly or Council which elects them.

The Board ordinarily meets once a year at Trivandrum to review the work of the Department of Agriculture and Fisheries during the previous year and to chalk out the programme for future work. Special meetings may be convened by the president on his own motion or at the written request of not less than five non-official members. The Board is expected to bring to the notice of the officers of the Department pressing needs in agricultural and allied problems and seek their help to evolve ways and means to solve them and to popularise the solutions worked out by the officers in their research laboratories and experimental stations. Non-members may attend the meetings of the Board and may, with the permission of the president, take part in the discussion but shall not vote on any question. The meetings of the Board are open to the press unless otherwise decided upon by the president. The functions of the Board are only advisory.

The Board met for the first time from the 5th to the 9th of Edavam 1111. It reviewed the work which the Department had done theretofore and chalked out a programme for the future, adopting in all fifty-three recommendations for the development of the department, the widening of its functions and a re-orientation of its policies so as generally to increase its usefulness to the public. These recommendations were submitted to the Government, who have already passed orders giving effect to some of them, while the rest are still under consideration.

The term of office of the non-official members elected to the first Board expired in Minam 1112 with the dissolution of the Assembly and the Council which elected them. In their place fresh members were elected by the new Assembly and Council when they first met in Mithunam

1112. The Board as at present constituted consists of fifty-five members.

In 1934 Travancore applied for and was admitted to the membership of the Imperial Council of Agricultural Research. The Dewan was accordingly nominated a member of the Governing Body and the Director of Agriculture and Fisheries, a member of the Advisory Board. Although the Government have the right to nominate another member to the Advisory Board to represent Animal Husbandry interests, no additional member has so far been nominated, as the Veterinary or Animal Husbandry work in the State is also being controlled by the Director of Agriculture.

Soon after Travancore secured membership on the Council a scheme for an intensive investigation of the root disease of the coconut palms was prepared and submitted through the Government to the Council with an application for a research grant. This scheme was approved with slight modifications made by the Expert Committee of the Council and a grant of Rs. 25,500 spread over a period of three years in the first instance has been sanctioned. A qualified Plant Pathologist, with an Assistant and other necessary subordinate staff, has been appointed to carry on this investigation from March 1937.

Another work in which the State is co-operating with the Imperial Council is the marketing surveys organised by the Agricultural Marketing Advisor. As already observed two Marketing Officers have been appointed, one in charge of crops and the other of livestock products. They have already completed the surveys and submitted their reports on the marketing of wheat, tobacco, pineapples, eggs, cattle, milk, lin-seed, ground nuts, grapes, rice and coffee. The Central Marketing Staff are engaged in collating and

editing these reports on which they base their All-India Report for each commodity.

The report on the marketing of eggs showed the large scope which existed for improving the trade by grading. The Imperial Council has therefore established at Chengannūr (in Travancore) an Experimental Egg—grading and Packing Station which is designed to demonstrate to the producers and dealers the advantages of proper grading and packing. This station was opened in June 1937.

When Marquis of Linlithgow assumed the Viceroyalty of India, one of the subjects which engaged his attention very early was the improvement of the cattle of the country. His Excellency stressed the importance of the studd bull in grading up the poor country stock and advised the Imperial Council to take up the matter seriously. The Animal Husbandry Expert to the Council drew up a scheme for the work in which Travancore is now co-operating with the other states and provinces.

Of the special enquiries which the Council undertook from time to time, Travancore was particularly interested in the Coconut Enquiry conducted in 1934-35. Coconut, the chief money crop of the State, was faced with serious competition from Ceylon and other foreign countries and consequent unremunerative prices, while the Indian oil crushers pressed for larger imports alleging shortage of local supplies. The enquiry was directed to ascertain the truth about these conflicting claims. The Mycologist of the Agricultural Department was placed on special duty for some time to work with the Enquiry Officer and later to furnish such additional information on the subject as was required. This enquiry and the subsequent discussions convinced the Council of the difficulties of the Indian coconut producer and recommendation was made to the Government of India for the enhancement of the tariff duties on foreign copra.

BIBLIOGRAPHY

- Aikman, C. M.
 Belfor, Roland.
 Brown, Scott.
 Burn, R. S.
 Dutt.
 Elbourne, E. T.
 Ferguson.
 Ghosh, H. H.
 Gray.

 Howard.
 Howard and Howard.
 Johnson, W. H.
 Kealing.

 Kenny.
 King, F. H.
 Kunjan Pillai, N., Dr.

 Mukerji.
 Morton.

 Narāyana Iyar, K. R.
 Patch, J. S., Dr.
 Pinches.
 Rāma Rao, M.
 Scott, J.
 Somerville.
 Tweed Isa.
 Voelkar.
 Vincent, J. R.
 Watts.

 Wright.

 Manures and Manuring.
 All about coconuts.
 Soil, Manures and Crops.
 The Cattle, Sheep and Horses.
 Economic History of India.
 The Marketing Problem.
 All about Pepper.
 Sugarcane.
 Introduction to Agricultural Economics.
 Crop Production in India.
 Indian Agriculture.
 Elementary Tropical Agriculture.
 Agricultural Progress in Western India.
 Intensive farming in India.
 The Soil.
 Travancore.
 Census Report, 1931.
 Agriculture.
 Handbook of Indian Agriculture.
 A Cyclopaedia of Agriculture, Vols. I and II.
 The Manure Problem in Travancore.
 Coconut Enquiry in India.
 Note on Tea.
 Flowering Plants of Travancore.
 Field Implements and Machines.
 Agriculture.
 The Cow Keeping in India.
 Agricultural Improvement of India.
 Note on Rubber.
 Dictionary of Economic Products, Vols. I—IV.
 The Standard Encyclopaedia of Agriculture, Vol. I—XII.

Agriculturist : Preparing crops for the market.

Agricultural Journal, Madras, old volume.

Administration Reports of the Agricultural Department of Travancore.

Manual of Instruction for the collection of Agricultural statistics

Short notes on insect pests of crops.

Note on '*Utricularia Peticulata*'.

Short Notes on Fibrous plants in Travancore.

Diseases of Coconut Palm.

Proceedings of the Board of Agriculture.

Proceedings of the Conference of Agricultural officers.

Report on the work of the Mycologist on Deputation.

Commercial Review, Vols. I and II.

Report on the Royal Commission on Agriculture in India.

Administration Reports of the Government of Travancore from 1930.

Statistics Volumes of the Government of Travancore Vols. I to XVIII.

Agricultural Debt Redemption Committee Report.

Economic Depression Enquiry Committee Report.

Banking Enquiry Committee Report.

CHAPTER XVIII

IRRIGATION

Irrigation plays an important part in the Agriculture of Travancore in so far as cultivation in Nānjanād mainly depends upon channels and channel-fed tanks. North Travancore does not stand in need of any elaborate or costly irrigation works on account of its heavy and unfailing rainfall. The dependence of South Travancore agriculture on irrigation projects and the necessity for State assistance were recognised so early as 1010 M. E. (1834 A. D.), when an Irrigation Maṭāmāth Department was established in Nānjanād. Side by side with this State activity a few societies of pioneers were formed for irrigation works in Nānjanād under the general supervision of the visiting engineer, Lieutenant Horsley.

Irrigation in South Travancore mainly depends on the Paraḷayār, the Kōthayār and the Paḷayār. The dam across the Paraḷayār is claimed to be the earliest irrigation work in South Travancore. The origin of this dam is shrouded in obscurity. But it is believed that the Pāṇḍyan rulers were responsible for the construction of this dam. Later, a channel known as the Pāṇḍyan Kāl was constructed. This channel conducts the water into the Paḷayār, whence it is distributed by eleven anicuts to a length of about twenty miles to eight principal channels besides minor ones of a total length of about sixtyfour miles. In 1750 A. D. another dam known as the Puṭhen Dam was constructed to irrigate the regions of Eḍanād. A channel called the Padmanābhapuram Puṭhenār was also constructed.

But these two works were not sufficient to supply Nānjanād and Eḍanād with the full quantity of water necessary for cultivation. The inadequacy of the supply



Padmanabhapuram Puthanar.

together with the partial success of the above mentioned channels induced the authorities to consider the possibility of a similar scheme in the neighbouring river, Kōthayār. The first attempt in this direction must have been made during the early days of the last century as is evidenced by the remains of a masonry dam, Kākachāl. The scheme was investigated between 1837 and 1850 by General Cullen and Captain Horsley. The preliminaries connected with the same were vigorously prosecuted; but shortly after, the matter was dropped. The only work done during the several years which followed was the restoration and improvement of the Nānjanād Pullenār and the Anandanār.

But these stop-gap arrangements did not solve the problem of irrigation in Nānjanād. The water supply continued to be precarious. The Chief Engineer of the time proposed an earthen dam across the head of the Paraḷayār at its junction with the Kālikaśam river and thus postulated the formation of the Peṇinjāni reservoir. In 1877, Dewan Nāṇu Piḷḷai reopened the proposal for an anicut to supply water to Eḍanād. A scheme was accordingly prepared for diverting the waters of Kōthayār into the Paraḷayār by means of a dam forty feet high and a channel $12\frac{1}{4}$ miles long at an estimated cost of Rs. $4\frac{3}{4}$ lakhs. It was deemed advisable to have the scheme thoroughly investigated and reported upon by a competent hydraulic engineer. When the scheme reached this stage, Dewan Nāṇu Piḷḷai retired.

Dewan Rāmiengār made an official tour in July 1881 in Nānjanād in the course of which he inspected the irrigation works. On finding that the stage of the works was very unsatisfactory the Dewan directed the Chief Engineer to take such immediate steps as would be calculated to bring about an improvement. The Chief Engineer thereupon reported that four works had to be taken up urgently. He suggested that the leakage in the Pāṇḍyan

and Puñhen dams should be stopped, that the Pāṇḍyan Kāl should be widened and improved, that the Padmanābhapuram Puñhenār should be completely restored, and that a new channel from the Kōthayār at Thrippārappu should be cut for irrigating parts of the Viḷavancōde taluk. The Government thereupon got down Col. Mead of the Madras Public Works Department in 1879 to examine the several schemes. He expressed the view that the Pāṇḍyan Canal, the Padmanābhapuram Puñhenār and the Puñhen Dam should be improved and the head works for the two main channels constructed. In his opinion, the Kōthayār scheme was premature. The Government accepted his suggestions and the improvement suggested by him were completed in 1885. The combined head works were formally opened by His Highness Śrī Viśākhom Thirunāl Māhārāja on the 5th March 1885. His Highness observed on that occasion; "When events shall have proved that after the waters of the Parayār have been economised to the utmost extent, they have fallen short of the demands of the agricultural population, it will be time to woo her twin sister the Kōthayār and to consider at what point and in what manner she might be best coaxed to yield up her treasures into the common coffers which these head works constitute."

The time præsaged by His Highness soon arrived. In spite of the improvements, the water supply of south Travancore remained inadequate. Owing to insufficiency of storage facilities the waters drained off to the sea, while the paddy lands suffered from want of water during cultivating seasons. About 1892 the government took up the question again as to how to prevent this wastage and secure a uniform supply of water to the above districts. It was Mr. A. H. Jacob, Chief Engineer, who finally brought to shape the scheme for the construction of a masonry dam at Pēchippāra. His scheme was a modest one. Its only aim was to supply sufficient water for the cultivation of an area of some 38,000 acres, of which 23,000 acres were

already under best cultivation, while 15,000 acres were to be converted into paddy lands. The original estimate of the work was Rs. 8 lakhs. Mr. Jopp, who succeeded Mr. Jacob, was responsible for developing the project to its present proportions. The estimate was revised for Rs. 28 lakhs. This estimate provided for the increased storage capacity of the reservoir so as to be capable of irrigating new lands to the extent of 40,000 acres and to supplement the water supply to existing wet lands to the extent of 25,000 acres. Mr. Cecil Smith, who succeeded Mr. Jopp, revised the estimate further and the cost went up to Rs. 54 lakhs. He brought to the notice of the Government that the Right Bank Channel which was designed to irrigate 16,000 acres of land in Viḷavancode and Neyyāttinkara taluks could not function successfully on account of the inadequate supply from the reservoir and the high cost of the work which was estimated at Rs. 16 lakhs. Further investigations having shown the desirability of taking up the Thōvāḷa Channel in preference to the Right Bank Channel, work in the latter was stopped and the revised estimates for the construction of the remaining works which came to nearly Rs. 54 lakhs were sanctioned in 1904.

The work was pushed on vigorously and in 1905 water was let down the Left Bank Channel for the first time. But at some places breaches occurred, which caused considerable anxiety. Mr. A. H. Bastow, the Chief Engineer, made certain proposals to remedy the defects. At the request of the Travancore Government the services of Mr. H. E. Clerk and Major W. M. Ellis, were placed at their disposal by the Government of Madras. These Engineers recommended the abandonment of the Right Bank Channel and favoured Mr. Bastow's proposals with some further suggestions. The Government sanctioned the new scheme and the works were promptly executed.

Several items, such as, estimate for increasing the discharge capacity of the escapes, suspected crack in the

main dam, improvements to Anandanār and Anandan Kuḷam Kāl Extension, improvements and special repairs to T' code Channel and E. B. C., and the prosecution of the Thōvāḷa Channel and E. K. Kāl were attended to. The construction of the Eṛaṭṭakkaṛa Channel, a major scheme which was not contemplated in the original Kōthayār Project, was also taken up and completed at a cost of Rs. 7 lakhs on the recommendation of Messrs. J. Kuriyan and H. A. Minchin, Executive Engineers. The reservoir was opened for irrigation in June 1907. The Right Bank Channel had to be abandoned on account of its prohibitive cost.

The proposal for revenue investigation was then taken up and a Special Officer was appointed to fix the levy of cess, etc. The Special Officer *inter alia* suggested the provision of a scouring sluice in the Puṭhen Dam and other minor schemes for extending wet cultivation and made proposals for the assessment of lands under the Left Bank Channel. As a result of the statistical investigation the Special Officer suggested an irrigation cess of Re. 1 per acre on all registered wet lands under the Project and a cess of Rs. 7 per acre on all registered dry lands converted into wet lands. The Government accepted the proposal of the Special Officer and passed orders thereon in 1083 (1907 A. D.). The Special Officer had pointed out in his report to the Government that about 3,500 acres of the beds of the old irrigation tanks would become available for cultivation. These lands were sold in auction under the orders of the Government. From that time to 1113 M. E. tank beds have been sold and Rs. 10,88,272 realised and credited to the Capital Account of the Project.

For purposes of easy distribution the channels under the Project are divided into 8 systems and the lands irrigated under these systems are noted in Table II given at the end of this chapter. The maximum discharges of the channels and the full supply depths are given in Table III. In 1920, at the decline in the annual extent of conversions of dry

lands into wet lands within the area commanded by the Kōthayār Project, the Government considered it essential that steps should be taken for facilitating speedy conversions. To effect this, the Government appointed a Special Officer with a survey staff to assist him. In consultation with the Public Works Department the Special Officer suggested several works, such as opening of seepage channels, etc., to enable speedy conversions.

Several works were carried out in the main dam itself and the channels under it; the following being the more important among them :—

1. Removal of the gates and closing up of the under-sluices and R. B. sluices. Originally the under-sluices of the dam were inserted with a view to prevent the silting up of the reservoir bed, to permit the unwatering of the reservoir and to facilitate the constructions of the dam. They had served the last purpose. But so long as the under-sluices were there, they might require periodical overhauling which under existing arrangements could not be done except after unwatering the reservoir. The gates are not used as a means of escape and they rust unseen.

2. Raising the crest of the Puṭhen Dam. The necessity for this was felt and the work was carried out in 1923. Subsequently a scouring vent to the dam with screw gearing shutters was built in the places of the wooden needle shutters provided before.

3. Construction of the Āruvikkāra Channel. With a view to improve the irrigation facilities in the pakuthis of Thīruvaṭṭār, Thrippaṛappu and Āttūr in Kalkulam taluk, the Government sanctioned the opening of two distributary channels on either ends of the Āruvikkāra Dam across the Paraḷayār, which was built long ago near Thīruvaṭṭār, and the works were carried out between 1089 and 1102 at a cost of Rs. 66,600. This channel could be supplemented by the Kōthayār water through the scouring vent in the Puṭhen Dam.

4. Closing the leakages of the main dam. Percolation through the masonry of the main dam was increasing year after year, especially between 288·00 and 296·00, which caused great anxiety, and the Government ordered the grouting of the crevices with cement and pointing the face of the dam. The work of cement grouting under pressure by drilling holes from the top surface of the dam was started in July 1931. The effect of the grouting is very satisfactory and most of the leaks have been stopped.

With a view to increase the storage capacity of the Pēchippāra Reservoir to meet the demand for water for new conversions, a proposal was made by the Chief Engineer, Mr. Bastow, as early as 1913 to raise the F. T. L. of the reservoir by three to four feet and to provide screw-gearing shutters over the escapes. An investigation was conducted in 1918. The present full lake level of the reservoir is plus 296·00 above the sea level and the area of the water spread at this level is 5·01 sq. miles against 7·00 sq. miles originally estimated before the construction of the dam. The perimeter of the lake at this level is 43 miles. The capacity of the reservoir with the area of the water spread above the Left Bank Channel crest up to the M. W. L. are given in Table IV.

The total outlay on the Project to the end of 1100 was Rs. 87,02,047, of which the construction of the main dam and head works cost Rs. 21,30,002.

Progress of conversions:—The Kōthayār project irrigates 35,901 acres of old wet lands, 1,693 acres of converted tanks and 18,468 acres of newly converted dry lands, yielding a cess of Rs. 1,67,418. Another 6,500 acres of dry lands are likely to be converted into wet, but the progress is rather slow.

The project is the most important irrigation work in the State. But the importance of irrigation tanks in the southern division and in Shenkōtta can never be underrated.

Even in Nānjanād which is commanded by the Kōthayār Project there are certain places where cultivation is carried on with the help of tanks.

Aramboly group of tanks in Thōvāla taluk:—Such, for example, are the lands between the Thōvāla Channel and the frontier in Thōvāl taluk. On account of the scanty rainfall in this tract failure of crops often occurred. In 1915 the Government ordered an investigation into the condition of the tanks in this area. The tanks were soon improved. To supplement the flow from the Poigai hills which feeds these tanks during rains another stream, Erappayār, was diverted by putting up a diversion dam. Investigations are being conducted with a view to add to the supply by diverting still another stream the Chungan Ōḍai. The construction of a reservoir at the foot of the Poigai hills is also under contemplation.

The Viḷavancōde taluk and a portion of the Kalkulam taluk west of Pāmbūrī Vāikāl entirely depend on rainfall for agriculture. And rains were so uncertain that the storage capacity of the tanks in these regions had to be improved. Investigations were therefore conducted and 92 tanks were improved at a cost of Rs. 1,75,349 between the years 1098 and 1110.

All Major Irrigation works in the State were transferred to the P. W. D. for restoration and maintenance and also distribution of water* and all minor and petty irrigation works were transferred to the ryots concerned for their maintenance, the distribution of water alone being left in the hands of the officers of the Revenue Department. All works of whatever kind within the commanded area of the Kōthayār Project were, however, declared "Major Irrigation Works". The P. W. D. Sub-Division Officers elsewhere, who were also declared "Irrigation Officers" within their

* Vide Rule II of Revised Rules passed by Government under date 20th May 1922.

respective jurisdictions, were authorised by virtue of their office, to exercise or perform all the powers or duties conferred or imposed on them by Sections, 8, 9, 10, 11, 11A, 12, 13 and 14 of the Regulation in so far as Minor Irrigation Works were concerned.

A new Irrigation Division with headquarters at Quilon, having jurisdiction over all the irrigation works in the State excepting those to the south of the Kulīthura river, was formed in Mīnam 1109 with a view to ensure sufficient control over the irrigation activities of the State. It consists of three Sub-Divisions with headquarters at Quilon, Changanāssēry and Mūvāttupūla. There are three Sections in each Sub-Division. The six Irrigation Investigation Sections of the territorial divisions were absorbed in the new jurisdiction. The opening of an Irrigation Fund administered by the Financial Secretary was also sanctioned.

In Viḷavancōḷe taluk only a very small area to the west of the Kōthayār is benefited by the Major Irrigation Scheme. There is a large number of irrigation tanks in this region which are entirely minor and petty works. Much useful work has, however been done since the transfer of the works to the P. W. D. by way of restoration of the minor irrigation tanks. Considerable sums of money have also been spent in closing breaches and repairing rain damages every year. The number of minor irrigation tanks improved between 1098 and 1111 was 48. During the same period eighty six different works were executed in Neyyāttinkara taluk and 56 in Trivandrum. Neḍumangāḍ taluk contains very few minor irrigation tanks. Only two tanks have been restored. Chirayinkīḷ taluk contains only a few tanks which come under "Minor Irrigation". Much of the expenditure incurred in this taluk since the formation of the Irrigation Division has therefore been confined to repairing flood damages. But the restoration of important tanks and irrigation thōḍus has been investigated and estimated for.

The only other tract of country in Travancore where artificial irrigation exists to any considerable extent is the Shenkōṭṭa taluk where the area irrigated
Irrigation in Shenkōṭṭa. is nearly 8,500 acres, lying in patches interspersed with British territory. As in south Travancore, irrigation in this part is carried on mostly by means of tanks maintained by the Revenue Department. A good amount is spent annually on improvements and an annual recurring grant is sanctioned for the maintenance of major irrigation tanks and channels.

A scheme for the improvement of irrigation in Shenkōṭṭa at an estimated cost of Rs. 3,39,890 was sanctioned in 1082, the cost for the preparation of the estimates being limited to five years' average revenue from the āyacut of the tanks proposed to be improved. For purposes of estimating and improving, the whole area was divided into four river basins, the following being taken as Major Basins and the streams running into them as Minor Basins.

1. Hanumandi Basin,
2. Karuppanadi Basin,
3. Haṛihaṛasandi Basin,
4. Kuṇḍār Basin.

These were duly estimated for and fully worked out.

The whole irrigation system in this tract was under the control of the Revenue and Maṛāmāth Department till Eḍavam 1081, when it was transferred to the P. W. D. In Chingam 1111, the works in the Shenkōṭṭa Irrigation Section were transferred to the control of the Irrigation Division Officer but were again retransferred to the Quilon P. W. D. Territorial Division in Mithunam 1111, as it was thought preferable to entrust both the road and irrigation works to a single Section Officer so as to give him sufficient work throughout the year.

The claims of irrigation in North and Central Travancore drew the attention of the Government North Travancore. only in very recent times. So the works merit a brief mention. There are only two irrigation works in the Alwaye Division :—

1. *The Thalayār Right Bank Channel.* This is 4 miles in length. It has cost Rs. 23,000 and irrigates 300 acres.

2. *The Kānthallūr Dam* is nearing completion and is estimated to cost Rs. 23,020. The dam commands an area of about 640 acres of paddy fields, but the water impounded will not be sufficient to irrigate all this area. Thus the object of this scheme is only to supplement the supply during the dry season when all other sources of water supply are exhausted.

The repair and restoration of such channels and bunds as were in existence were left for the most part to the ryots themselves. But this arrangement did not work well. Owing chiefly to the want of co-operation among the ryots all such works were neglected, and the damage to cultivation in consequence was very great. With a view to help the ryots, His Highness the Mahārāja was pleased in 1062 M. E. (1886-87 A. D.) to sanction an annual grant of Rs. 20,000, subsequently raised to Rs. 30,000, for the Northern and Quilon divisions and parts of the Trivandrum division. The grant was to be expended on irrigation and drainage channels. The moneys spent were made recoverable from the ryots along with the tax. The rules also provided for a portion of the expenditure, not exceeding one-half in each case, being borne by the Sirkar, if on special grounds it was found necessary to show such consideration.

This arrangement again did not serve the purpose intended ; in no year were the funds availed of to any large extent, nor had the expenditure of past years been fully recovered from the ryots concerned. The rules were accordingly superseded by Regulation III of 1072 which provided for the construction, repair and maintenance of irrigation

works and for the conservation and distribution of water for purposes of irrigation. To quote the Administration Report of that year. "This important measure adopted after much deliberation and discussion brings the interests of agriculture throughout the State under a regulated system of even treatment in respect of irrigation with due regard to special local conditions". The scope and effect of its operations are calculated to be of far reaching benefit to the ryots.

Subsequent to 1062 M. E. (1886-87) a series of very important original irrigation works were Reclamations. completed by the Public Works Department. The more important of them were :—

(1) The Puṭhenvēlikkaṛa Reclamation Scheme, consisting of the construction of a pitched embankment and a masonry sluice to keep back the brackish water from entering a large area of valuable paddy cultivation. This was the first of the reclamation schemes carried out in North Travancore.

(2) The Vaḍavattūr Reclamation Scheme, which consisted in the deepening of a rock cutting, originally commenced at a very ancient date, to a level enabling the Vaḍavattūr paddy flats to be more quickly drained than they were till then, ensuring more land being brought under cultivation and the existing land to be cultivated more satisfactorily.

(3) The Munampam Reclamation Scheme, by which a short but deep bank was raised across the backwater near the Paḷlipōrt Bar and it was provided with pitching to protect it against the strong waves beating on it, thus securing a large area of shallow backwater against brine.

(4) The Kaipūḷa Scheme for the prevention of the access of brackish water to the very large area of paddy land between Kōṭṭayam and Valyānappūḷa in Vaikom by bunding off the principal rivers as they enter the

backwaters, diverting them to the present sour land and sweetening the soil in the process; and by the construction of a nearly straight canal from Kōṭṭayam to Vaikom with a view not only to carry fresh water into the paddy flats from the Kōṭṭayam river, but also to enable boats to proceed to and from Vaikom without encountering the long and at times dangerous journey through the Vēmbanād Lake.

(5) The Kainakāri Embankment Scheme for the improvement of the existing embankment by rivetting the side exposed to the backwater, so as to protect the fields on the south from the ingress of brackish water from the Vēmbanād Lake.

(6) The Parūr Reclamation Scheme. This was another expensive work consisting of the construction of a pitched embankment about a mile southward, enclosing thereby a large area of land fit for paddy cultivation and preventing the entrance of salt water. The estimated cost was Rs. 89,246, but in actual construction the amount far exceeded the estimate. The bund was completed long ago, but after an expenditure of nearly Rs. 1,05,000, the scheme, the object of which was to keep out the salt water for purposes of cultivation, was found to be impracticable. It was resolved to have a regular survey of the whole of the occupied and unoccupied area comprised within the bund. On the completion of the survey the lands were subjected to the new settlement by a special agency appointed for the purpose. The Scheme has since been allowed to lie over, further expenditure on the work being restricted to what is absolutely needed for maintenance.

(7) The restoration of the Kallāḍa river banks in the Quilon Division was another important scheme commenced in 1065 M. E. (1889-90) and completed about 1069 M. E. (1893-94) at a cost of more than Rs. 22,000.

These reclamation works are of great benefit to the ryots as they have large tracts of land fit for cultivation

and others secure against floods and the inrush of saltish water from the backwaters.

Since the submission of the report of the Minor Irrigation Committee and the Government order thereon, several works of minor and petty irrigation have been conducted in the northern taluks of the State.

A scheme to supply water by electricity to high level lands on the banks of the Periyār river in Kunnathunād taluk is under investigation in connection with the proposed supply of electrical energy from the Paḷlivāsal Hydro-Electric Scheme. These are done in accordance with the recommendations of the Minor Irrigation Committee.* The Athirappally Scheme is also under investigation and a Guage House and Water Level Recorder have been erected at Athirappally. Notwithstanding the assumption made in the report it has now been gradually realised that there is much scope for intensive and extensive irrigation in North Travancore, and it has been made part of the duty of the new Irrigation Division to take steps to assess the possibilities and work out the necessary schemes.

Table I shows the amount that has been spent on Protective and Productive Irrigation from 1098.

* Vide paras 72 to 84 of the Minor Irrigation Committee Report.

TABLE I.

Year	Protective Irrigation	Productive Irrigation	Total.
1098	70,685	1,70,321	2,41,006
1099	94,691	1,03,983	1,98,674
1100	1,47,397	98,987	2,46,384
1101	1,38,650	1,65,126	3,03,776
1102	91,114	1,05,477	1,96,591
1103	1,29,866	88,280	2,18,146
1104	84,541	72,851	1,57,392
1105	93,468	72,756	1,66,224
1106	1,20,445	73,360	1,93,805
1107	91,585	63,063	1,54,648
1108	96,888	87,526	1,84,414
1109	1,04,516	1,01,835	2,06,351
1110	1,22,155	1,02,417	2,24,572
1111	1,66,664	92,105	2,58,769

TABLE II.

System-war lands under the Kothayar Project.

Name of system	Old wet lands	Converted dry lands	Tank bed sold and converted
Thōvāla Channel	4,232	7,129	...
N. P. Channel	7,535	1,174	...
Paḷayār	6,755	68	...
Anandanār	7,638	3,212	...
E. K. Kāl	2,402	3,377	...
P. P. Channel	4,016	151	...
T. Code Channel	3,173	3,239	...
Miscel: L. B. C. and Aṟuvikkaṛa	1,150	118	...
Total	36,901	18,468	1,693
Grand Total	.....	.....	57,062 acres.

TABLE III.

Discharge of Main Channels under the Kothayar Project.

Name of Channel	Maximum Discharge	F. S. L.
L. B. C.	672	5.5
P. P. Channel	633	5.0
E. K. Kāl	150	3.0
Thōvāḷa Channel	153	4.5
Pāṇḍyan Kāl	442	5.0
Anandanār	180	4.0
N. P. Channel	110	5.2
T. Code Channel	150	4.5

TABLE IV.

Area of the water spread and volume of water at the various levels of the Pechippara Reservoir.

Reduced level of the Reservoir	Area in Acres	Volume of water in millions c. ft.	Remarks.
254.00	1,060	0	Sill of left Bank Channel
259.00	1,310	253.20	
264.00	1,520	558.10	
269.00	1,630	899.60	
274.00	1,680	1,259.40	Full lake level.
279.00	1,800	1,629.60	
284.00	2,280	2,058.30	
289.00	2,770	2,598.20	
294.00	3,120	3,234.50	
296.00	3,230	3,509.00	
298.00	3,310	3,792.15	
300.00	3,350	4,082.95	
302.00	3,500	4,381.55	
305.00	3,680	4,846.26	

BIBLIOGRAPHY

Administration Reports of the Govt. of Travancore.

Minor Irrigation Committee Report.

Papers re: Kōthayār Project.

State Manual, (1906).

CHAPTER XIX

FISHERIES OUR "WEALTH FROM THE DEEP."

Hunting and fishing as chief economic activities of the primitive men preceded even agriculture and farming and hence, in the early stages of the progress of the human race, fisheries held a relatively more important place than in the recent centuries which saw the development of diverse industries and manufactures. In the days before the invention and introduction of a medium of exchange, when trade had necessarily to be carried on by barter, it is said that products of the sea, such as amber, coral, salt, fish and shell-fish, were the first articles to be bartered by the uncivilised man. It is also interesting to know that wampum or strings of shell served as money among certain tribes of North American Indians. The rise of the modern maritime nations can be traced to the past when man ventured upon the deep ocean for fish to satisfy his hunger. Such fishing ventures paved the way for the rise of the ancient Phoenecian fleet as well as that of the Greeks. So too the bleak and barren shores of Scandinavia drove the starving Norseman to the sea and made him an expert fisherman. In mediæval times Britain had a great fleet whose only occupation was fishing in the North Sea. Though the haul of fish in the ancient days was small compared to that at present, the fishing interests of various peoples clashed with one another and led to keen rivalries, disputes and even wars. It was the imposition of a customs duty by the Danes upon all imports of herring that enraged the Hanseatic cities and made them declare war upon the Danes. Herring fisheries again formed the bone of contention between the English and the Dutch throughout the 17th century. Even in more recent years, fishing in the Pacific, the Berring and the

An important economic activity in primæval days.

North seas has caused considerable disputes between Great Britain, Japan, Russia and the United States of America.

Such then was the position held by fisheries in the great maritime countries of the world. Though authentic records pointing to a parallel history for Travancore fisheries are not available, the magnitude of her fisheries in relation to the fisheries of the world might well justify the hypothesis that this country too held an enviable position from very remote times.

Fishing was a lucrative occupation in Travancore from the earliest times. The old Malayālam ballads afford stray proofs of the importance of the Travancore fisheries in the past, while the Valavīśu Purāṇam, whose date is still unsettled, is an ancient Malayālam treatise containing several references to the methods of fishing in vogue here and to the arts and sciences relating to fishing.

Travancore has a long coastline and a vast extent of inland waters which give her a very important place among the maritime states of India. It is estimated that the value of the total catch of the world amounts to 25,000 lakhs of rupees per year. Luckily for Travancore, the Wadger Bank which is one of the best twenty fishing grounds of the world is situated near her coast, and she is peculiarly fortunate in being able to haul 1/200 of the total quantity of fish caught throughout the world. The physical features of the Travancore coast are in general so admirably suited for fishing operations that fishing boats regularly resort to the sea early in the morning with a strong breeze and normally return in the afternoon with the sea breeze. The bed of the sea slopes gradually to a depth of thirty fathoms which is the trawling limit. The whole of the 8,000 square miles of fertile fishing ground near the Travancore coast has a more or less smooth undulating bottom usually of sand, mud or ooze. The continuous

Natural advantages
and wealth of Tra-
vancore fisheries.

fine weather lasting for about three quarters of the year from October to May is a decided advantage to the fishermen who have to set their sail entirely by the fairness of the weather and the favourable direction of the winds. It is this natural advantage that makes the Travancore waters superior to those of Europe for purposes of fishing. The regularity and certainty of the weather on the Travancore coast contrasts strongly with the uncertainties and the bewildering changes of weather one meets with in the North Sea and the Newfoundland and Japanese waters. In the absence of the natural advantages of weather and the direction of the prevailing winds, it would have been impossible to risk even short voyages with the crank canoes and catamarans which are the only fishing vessels now used by the fishermen of the State. Very many varieties of nets involving the principles of cast nets, seine nets, ground seine nets, wall nets, trap nets, drift net and small trawl nets of the paranzall type are being used in Travancore for capturing fishes. They are known by several names and it is not essential that all of them should be described here. Though 8,000 square miles of sea are available for tapping near our coast, only 1,200 square miles are being harvested by the present method, since the Travancore fishermen venture only up to an average limit of six miles from the shore for capturing fish. As 90,000 tons of edible fish are landed every year from the inshore waters of the State, it may be calculated that an acre of inshore water yields nearly 2 cwts. of food materials, and this is double the quantity produced by an acre of water considered to be rich by the fishery experts of the world. It can also be computed that the 6,800 square miles of sea left untapped beyond the coastal waters should annually yield five lakhs of tons of fish. Although this is the theoretical yield, it can be stated with certainty that at least half this quantity of marine wealth, which is sometimes spoken of as the 'leaping wealth' is awaiting collection in the deeper waters near our coast,

The annual yield of the world fisheries has been estimated at a quantity of fish ranging from one crore and thirty four lakhs of tons. The fish landed on our coast compares very favourably with the catch in some of the European countries. The yield from our waters is not in any way less than that of either Denmark or Sweden. It may be interesting to note here that this footing of equality with countries like Sweden and Denmark enjoyed by Travancore at present has been attained without deep sea fishing and that, if deep sea fishing is also developed here, the State will not only excel those countries in point of her fisheries but occupy at the same time a very distinct position among the greatest fishing countries of the world. It is found that inspite of the small area covered by our State, the catch from her waters forms one fourth of the total catch of the Indian Peninsula.

The fishes of the world have been grouped in sixty-two orders falling under six broad heads of classification.

Prevalent species
and value of catch
under each.

Each order is divided into families which are further sub-divided into different genera and thousands of species of fish belong to each genus. The ichthyologists

have identified some 25,000 species in all and of these 350 to 400 species are found in the Travancore waters. Only the important varieties are known at present and among them the commercial varieties or money crops are few. A very large number of our fishes have yet to be identified.

The important varieties of our commercial fish are seasonal and migratory. They appear in our coastal waters only at definite periods of the year but then in very large numbers. The *Trichiuridae* or ribbon fish appear in our coast usually during June and July and nearly ten lakhs of rupees worth of this variety is caught every year. Shoals of the members of the *Clupeidae* or sardine family visit our coast during November and December and the value of the

annual haul of this fish has been estimated to be not less than fifteen lakhs of rupees. *Engraulididae* or anchovies to the same value is caught in December and January. A very delicious variety of fish known as *Lactarius delicatulus* visits our coast in August and September contributing annually five lakhs to the wealth of the State from fisheries. Fifteen lakhs of rupees worth of fish belonging to the *Scombridac* family (the true mackerals) is caught every year from November to January. Steer fish which is looked upon in this country as a denizen of the deep alone forms a considerable portion of the catch during this season and contributes about five lakhs of rupees to the value of our annual catch. Several kinds of sharks and skates (*Elasmobranchs* and *Hypotremate*) are also caught in Travancore and their aggregate value comes to another five lakhs of rupees. About the same amount is derived from the abundant Carangs harvested between November and February. The *Stromateidae* or pomfrets contributing about three lakhs of rupees per annum make their appearance continuously for five months beginning from November and this variety is also considered to be delicious. All the minor varieties of fish and shells available in our waters together contribute twenty seven lakhs of rupees to the wealth of the State from fisheries. In addition to these different varieties of fish the invertebrate prawns are found in plenty in our backwaters and the sea, and as they occupy a very prominent place among the commercial products from our waters, we must not omit to mention them when speaking of the Fisheries of Travancore. It has been calculated that the value of the prawns harvested annually from our waters comes to twenty lakhs of rupees. It may also be remembered that the prawns exported from Travancore find good markets in foreign countries. The statistics given above show that as much as 125 lakhs of rupees worth of different species of fish and shells are landed in our country every year.

Travancore is thus peculiarly fortunate in having at her coasts a steady and never failing source of wealth which can be drawn upon year after year. But the people of Travancore are not enabled to take the maximum advantage of the resources for want of proper organisation and facilities. Large quantities of fish are landed on particular days in the fishing villages and then the problem before the fisherman is the disposal of the commodity to his best advantage. There are days in which thousands of rupees worth of *Trichuridae*, *Lactarius delicatulus anchovis Clupeidae*, sharks and several other varieties are brought to shore and a very small fraction of this catch would be sufficient to meet the demands of the consumers of fresh fish. The question of preserving the surplus fish for later use is therefore of vital importance from the economic point of view. But the preservation of fish, a very easily decomposable matter as it is, is not so easy as its capture. The need for such preservation was understood from very ancient times and the very many methods evolved for the purpose continued to improve day by day.

Though there are different ways of handling and preserving big hauls of fish, the principles involved in them are the same. As the decomposition of fish like many other organic decompositions is bacterial in character, the causes that aid the onset and multiplication of bacteria in the air and water around us have to receive our attention when the question of preserving the enormous landings of our migratory fishes is considered. Though scientific knowledge on these points has not yet come within the reach of the Travancore fishermen, even before the theory of spontaneous generation and fermentation was propounded and led to the development of the science of bacteriology, our fishermen had by experience understood the main factors controlling the onset and development of the micro-organisms that caused the decay of fish and other food

materials in general; that is, they realised the conditions under which the micro-organisms could gain a field in the food materials and cause deterioration. They also understood that the presence of albuminoid and nitrogenous materials helped the quicker putrefaction of fish and that therefore speedier methods should be employed for their handling and preservation than in the case of other food stuffs.

When the necessity for the preservation of fish was felt, several methods came to be invented one after another. The civilised world today employs about half a dozen different methods for preserving this easily decomposable matter. They are all founded on a knowledge of the conditions under which bacterial decomposition is promoted or retarded. It is well known that moisture, air and heat are necessary for the development of bacteria when they are present in the natural conditions and that even when these factors are not excluded, antiseptic chemicals can retard the growth of the micro-organisms. The fishermen and the micro-biologists of the world have taken advantage of this knowledge to invent such different methods of preserving fish as drying, salting, pickling, canning, smoking and cold storage. The first three are the methods usually employed by the Travancore fishermen. These methods aim either at the exclusion of moisture from the food or at the inclusion of some antiseptic which would retard the development of bacteria.

(a) *Drying*.—There is a certain minimum of water content that will suffice for the growth of micro-organisms in fishes. When the quantity of water present in the fish is reduced below this minimum, it will be possible to preserve the fish for a considerable time. This is the principle of drying fish as a mode of preservation. The exact minimum of moisture that will permit the decomposing

Indigenous methods
of fish preservation.

organisms to grow in the fish depends upon the quantity and nature of the soluble materials, the amount of moisture distributed in the various tissues and the nature of the organisms found in the air and water around. The fishermen of Travancore by centuries of experience have worked out certain formulæ in which all these factors are taken into account in the method of drying fish in the seasons. Though several methods, such as subjecting the fish to artificial heat and currents of heated air, are known in other parts of the world, the only practice that is widely prevalent in this State is to expose the fish to the heat of the sun, this being a tropical country where there is plenty of bright sun light, throughout the major part of the year. The partial sterilisation of the fish preserved is accomplished by this process. It is said that the process of drying fish by exposure to direct sun light was in vogue among the Phœnecians also. Members belonging to the family of *engraulididae* (anchovies) are the most important among the fishes that are preserved by drying. Owing to the inability to procure sufficient quantity of salt or due to other causes, sometimes species of the *Clupeidae*, *Trichiuridae* and also some other minor varieties of lean fish are occasionally dried in the open sun. In all kinds of drying usually 70 to 90 per cent. of the moisture is removed and the dealers in the commodity are eager to see that the product is desiccated more or less in accordance with the distance of the market and the period for which it has to be preserved. Sixteen to eighteen lakhs of rupees worth of fish of the varieties mentioned above are preserved by drying and are exported from Travancore chiefly to the markets in Colombo and the Straits Settlements. Occasionally larger varieties of fish such as the members of *Scombridae* family and sharks are also dried in the sun. They are beheaded eviscerated, cleansed with sea water, filleted and suspended in the air for days together until they are hard enough to withstand the strongest pressure of the

tip of the thumb in the thick of the flesh. This kind of dried fish is technically known as "Stock fish". Though the quantity of fish produced by this method is not considerably large, it has a good home market in the High Ranges.

(b) *Salting*.—Next to drying salting is another important method used in Travancore for preserving all kinds of fish. Members of the families of *Pristidae*, *Rhinobatidae*, *Raiidae*, *Myliobatidae*, *Siluridae*, *Chirocentridae*, *Trichiuridae*, *Carangidae*, *Stromateidae*, *Scombridae*, and *Mugilidae* are the important fishes that are cured with salt in Travancore. Among these the major portion of the salted fish comprises the members of *Scombridae*, *Clupeidae*, *Carangidae*, *Trichiuridae* and *Elasmobranchs*. Nearly thirty lakhs of rupees worth of these fishes are preserved with salt and more than half of this quantity is exported to the neighbouring British Indian districts, Colombo, and the Straits Settlements. The rest is utilised for home consumption.

In this connection the principles involved in salting and the details of the process adopted in Travancore may briefly be explained. The notion among the lay public that common salt is an antiseptic is wrong. On the other hand, nearly all bacteria require some salt for their growth. Most of them grow far better in media containing one or two per cent. of salt than in similar media devoid of this inorganic substance. There are certain types of organisms called halophytes which can grow and multiply in concentrated salt solutions. Hence it has to be understood that salt mainly preserves fish by extracting water from them. The composition of the salt used in curing bears great importance in the matter of the penetration of salt into the tissue of the fish. Sea salt is commonly used for salting in Travancore. They contain varying proportions of calcium and magnesium salts and sulphates. Calcium and magnesium salts and sulphates effect a retardation of the rate of penetration of sodium chloride into fish during the salting process. This retardation of the rate of

salting permits more decomposition of the protein of the fish tissues during the process of salting. Calcium salts retard penetration of salt to a greater extent than magnesium salts if present in appreciable amounts. These facts are not generally known to our fishermen and, even when they understand it, they cannot easily obtain the kind of salt that they require. Hence the same kinds of fish even when cured by the same process are prone to differ in the keeping qualities in accordance with the kind of salt used. Calcium and magnesium present as impurities in the salt used for the salting of fish in Travancore affect the colour and firmness of the product to a considerable extent. Fish salted with pure salt are soft, flabby and of a light yellow or cream colour. The presence of as small an amount as one per cent. of calcium or magnesium salts causes a remarkable whitening and stiffening of the flesh. Salts of both these metals give a strong bitter taste to the salted fish. The commercial methods of salting fish in common use today in Travancore are of two kinds, the one known as brine salting accompanied by drying and the other dry salting. 'Dry salted fish' is a term which refers to the method of salting and not to the procedure followed in packing or storing fish. Compared to dry salting, brine salting is of relatively little importance in commerce. The fish presented by means of brine salting are cleaned well and placed in large cement tubs partially filled with concentrated salt solution. A small quantity of salt is spread on the top of the fish floating in the brine. Simultaneously with the extraction of the water from the fish by the brine in the tub, the salt passes into the tissues of the fish and soon the body juices become thickened with salt solution. When sufficient salt has passed in to coagulate all the proteins coagulable by sodium chloride, and when the cells have shrunk due to the loss of a large portion of their water, the inner flesh of the fish loses much of its translucent appearance and sticky feel. The phenomenon of the passage of the salt into and of the water out of

the fish is an example of osmosis in which the skin and cell membranes act as an imperfect semi-permeable membrane, which permits the passage of the water out and some salt in but prevents the passage of the colloidal proteins of the cell. As this process is going on, the fish are stirred in occasionally to prevent the brine from becoming too dilute at any point. A day or two after, the fish is removed from the tub and cleaned in sea water and dried in the sun. Nearly 60 per cent. of the water is removed by the two steps of dehydration. Fish preserved by brine salting are mainly exported to markets in Colombo.

The exact procedure followed in dry salting fish depends upon the kind of fish and the custom prevalent in a particular locality. For a general consideration of the subject a sentence or two may be said about dry salting. The round gibbed beheaded or split fish are washed and then packed in water-tight cement or wooden tubs with an excess of dry salt. The proportion of salt used for curing depends upon the kind of fish, the weather and the custom of the curer and varies from 20 to 35 per cent. of the weight of the fish. After a few hours sufficient pickle is formed to cover the fish which are not disturbed until they are completely salted. After the fish are removed from the containers and dried, they are again rubbed with salt just before packing in suitable materials. While the fish are being packed, salt is sprinkled over each layer of fish. But some deviations are made in the process of dry salting in some parts of Travancore. In certain fishing villages it is the custom even now to intern the salted fish in pits dug in the earth and cover with mattings or cadjans. A day or two after, they are taken out of the pit, resalted and immediately packed in a semi wet condition. The condition of the fish cured by this method is far from hygienic and the quality of the product too is very poor. But the fish consumers of the neighbouring districts of Tinnevely and Madura have somehow developed a taste for this delicacy

and hence there is good demand for the same in the markets on the other side of the ghats.

"Pickling" and "mild curing" are other methods of salting fish, but these are not of much importance in the commercial world. The process involved is therefore not detailed here.

Besides salt, vinegar is a harmless antiseptic that is being used in Travancore for preserving fish. Acetic acid is the active principle of the vinegars, the components of which give them their antiseptic properties. The quality and preservative action of the different kinds of vinegar vary and this has some bearing on the fish preserved. The dissimilarity in the flavour, colour and aroma of different vinegars is due to the presence of small amounts of other organic compounds whose nature depends upon the source of the vinegar. The higher the percentage of acetic acid, the greater is the preservative power of the vinegar and it has been proved that about 15 per cent. of this acid is required in the vinegar to stop the growth of bacteria in fishes in Travancore. As the very strongest vinegars alone contain the necessary quantity of acetic acid, weaker vinegars are powerless to preserve fish for long periods. Still it is admitted that the weaker ones which contain five per cent. or more of this component will retard the decay of the material for weeks. It is this kind and not the stronger variety that is being used in our country for preserving fish from decomposition. In the technical language, the fish preserved in vinegar is known as "marinated product" and is made delicious by adding spices such as chillies, onions, bay leaves, cloves, ginger, coriander seed and capers. To sterilise the fish before they are put into the vinegar, they are either baked or fried in suitable oils.

It is a general formula that a gallon of vinegar can preserve 50 to 75 lbs. of fish. Although the marinated products made in Travancore are not meant for exportation, it has been approximately calculated that about forty to

fifty thousand rupees worth of fish are treated in this way in individual homes and are consumed within our country. The members of the *Scombridae*, *Stromateidae*, *Mugilidae* and *Engraulididae* families are the fishes that are mostly used for the purpose. Among the marinated products it is held that *Etroplus surtensis* and *Etroplus maculatus* are the two fishes that are most delicious. The roes of several varieties of fishes are also marinated and preserved for food. So far as Travancore is concerned, the quantity produced by other methods of preservation, such as smoking of fish, is of very minor importance and is conducted occasionally in the huts of fishermen over their own hearths. In the absence of evidence to fix definitely the period when the fishermen of Travancore learnt to smoke their surplus catch of fish, it is supposed that they might have learnt the process of smoking, as in Europe when they first discovered how to make fire. While the details pertaining to the arts of smoking have undergone considerable changes, the technique regarding the same continued to remain constant all the time. The curer never felt that his ignorance of improved methods of smoking was a disadvantage to him because the fish consumer in Travancore did not demand better smoked products. Had he but done so, the fishermen would have endeavoured to improve their smoked product so as to suit the tastes of the consumers. Our fishermen could not be expected to mind the details regarding the kind of fish used and the properties of the smoke produced from the fire wood in his hearth, when he accomplishes the smoking of a few fish at times. He has no training to have a proper knowledge of the quantity of Pyroligneous acid, creosote, indol, skatol, etc., that are contained in a particular smoke obtained from a wood, and for smoking his fish he uses whatever material comes handy. The quantity of fish preserved in this way is, however, so negligible that a detailed description and criticism of the process now in vogue is hardly necessary.

With the development of scientific knowledge, still more improved methods of preservation, such as canning and cold storage, were introduced in the more advanced countries of the world. A cold storage plant has been recently installed in Trivandrum also. No doubt these methods of preservation of food would give an impetus to the development of the fisheries of Travancore, when already other schemes of effective industrialisation are being vigorously implanted to materially improve the prosperity of the country and its people.

A general description of the products that are now obtained from fish and the sea is given below. These are chiefly shark fins, fish oil, isinglass, fish-meal and guano and several kinds of shells, corals and sharks.

Shark fins:—Several species of sharks are caught in Travancore and they are either eaten fresh or salted and preserved. As soon as they are caught, their fins are removed and the cut portion is well salted or dusted with lime and dried in the sun. Finally they are graded, evaluated according to quality and exported to markets in China where there is a good demand for the product. A cup of soup made from first class fins of the sharks is sold in some of the high class hotels in Hongkong and Shanghai at a price not less than Rs. 5, and it is asserted by the Chinese that the shark fin soup has a special invigorating property. It is estimated that shark fins worth about a lakh of rupees are exported to China from Travancore.

Fins of sharks are white and black although they are perfectly white or perfectly black. The so-called white fin is drab and the black fin is dark gray. The following is the commercial classification of our shark fins.

Large white spotted fin:—This is the most valuable of the shark fins and is known among the Chinese as “Boon-Leong-Sit”. This is drab with scattered white spots and

the height of the dorsal fin of this variety is from twenty five to thirty centimeters.

Large white fin:—It is known as “Chu-Sit” among the Chinese and is similar to “Bocn-Leong-Sit” in colour and size, but it has no white spots.

Small white spotted fin:—The Chinese call this also as the large white spotted fin. It is obtained from smaller or younger sharks of the same species.

There are two kinds of small white fins known among the Chinese as “Peh-Sit”. They are drab in colour without spots. One of them being small and rough in texture is said to be the poorest among the white fins. There is no spotted variety large or small among the black fins as among the white. But corresponding to the other three kinds of white fins there are three varieties of black fins known among the Chinese by three different names. Apart from the kinds mentioned above there is another variety known to small black tipped fin which is called “Oh-Kin-Sit” by the Chinese. It is gray with a jet black tip. In spite of the details presented above one without practical knowledge and experience in the business will not be able to identify the different varieties of fins as such and classify them before they are exported to foreign markets.

Fish oils:—In Travancore oil is extracted from several members of the *Elasmobranch* group (sharks) and *Clupea longicepa* or oil sardine.

Oil from sardine:—This fish appears in abundance to the north of Nīṇḍakara in Travancore. The oil from sardines like that from Japanese “Iwashi” is made from the body of the fish and is technically known as body oil as distinguished from liver oils that are extracted from sharks. The sardine oils of Travancore can be classed into four grades (A, B, C and D) according to the colour and odour of the product. The oils extracted from sardines are utilised for various purposes. The common grade of oil, usually brown or black, can be used mainly because of its cheapness.

as baths in tempering steel and in batching jute. The better grade, brown to yellow, can be employed in leather dressing, in making "Dubbin" for leather goods, in the manufacture of saddle and harness and soaps, and in arsenals for use in "browning" rifle stocks. The better grades of the oil can be used as a mixture for making lubricating materials. Paints made with sardine oil can be used in farm fencings. The stearine or fish tallow deposited from the oil, has its uses in greasing brick moulds and in smearing and caulking fishing vessels and boats, and in mixture for wagon grease. Insecticide soaps made from fish oil stearine, with or without rosin, are very valuable for spraying purposes, and the refuse oil and stearine can be profitably utilised in manufacturing lamp black.

It is estimated that nearly 20,000 tons of *Clupea longiceps* used to appear year after year on the coast of Travancore. But in recent years, due to reasons unknown, the shoals of this fish do not appear in abundance as they used to do. Still it is expected that the original condition would again be established by nature.

Sardine oil is extracted by subjecting the fish to boiling in large pans and then pressing the mass in manual press. The oil thus extracted is left undisturbed for a few days and in the course of this period it gets separated from the water that incidentally gets admixed in the process of manufacture. This oil is separated by decantation and packed for sale in kerosene oil tins without further refining.

Shark liver oil. Both body oils and liver oils contains mixtures of glycerides of various fatty acids and hence in most respects they resemble each other. The iodine content and vitamine value are greater in the liver oil than in the body oil and these properties make the former useful for therapeutic purposes. To get over the difficulty of distinguishing sardine oil from shark liver oil, the following test is usually adopted. If a blue ring is formed at the zone of contact of the solution with the oil when liver oil

in chloroform is shaken with a freshly prepared solution of phospho molybdic acid, it can be concluded that the oil is from shark liver. The present method of extracting oil by exposing the liver to direct heat in open pans results in the destruction of the medicinal value of the oil because of the very high temperature at which it is extracted. Attempts are being made by the Fishery Department to educate the fishermen and to induce them to adopt improved methods of extracting oil at a temperature below 200° F.

Therapeutic value of the shark liver oils. Drummond found fat soluble vitamine in shark liver oil. McCollum, Simond, Becker and Shipley found shark liver oil highly effective for curing xerophthalmia, for protecting the body against the effects of a deficiency of calcium, and for the deposition of lime salts in rachitic bones. Our shark liver oil has been analysed and found to be a cheap substitute for cod liver oil. Dr. M. E. Naidu was administering the shark liver oils produced in Travancore to a large number of patients ailing from many diseases and as the following remarks of his are based on several years clinical observations, they are very valuable. "I have no hesitation in publishing the high effects of the oil, in the following conditions in which I have employed it very largely quite satisfactorily and in some cases with remarkable success.

1. "Rickets. In lean weak children with frequent cough and occasional diarrhoea, large belly and weak back bone, the oil is remarkably effective.

2. "Chronic infantile diarrhoea due to rickets or food deficiencies or very vague in causation and long continued.

3. "Night blindness. With muddy looking or silvery scales in conjunctiva. Shark liver oil by mouth and a few drops of the same in eye cures it in a few days.

4. "Emaciation. (leanness) of whatever origin, in consumptive families.

fish families. The fish sound which is also called the air bladder or swim bladder, is a hollow compressible sac, containing air situated in the abdominal cavity just below the vertebral column. The size of this organ varies in different fishes. The swim bladder consists of several tunics, the outer layer of which is thick and fibrous. The collagen contained in this layer is the source of Isinglass.

Nearly thirty to fifty thousand rupees worth of Isinglass is collected every year in Travancore from several fishes. In collecting Isinglass from fish the air bladder of the fish is removed as soon as it is caught. Then the sound is split and carefully washed either in cold or warm water to remove the blood, membranes and any adhering extraneous matter. It is then dried and packed for export to Singapore and Europe where it commands a good market. Isinglass is largely used in those countries for refining beer, cider and wine. It is also used in high class confectionary and as an invalid's food. In conjunction with Spanish liquorice and lamp black it is used in the manufacture of Indian ink, and with benzoin and sarsenet in the production of what is known as "court plaster." In China it is regarded as an article of food. The quality of Isinglass exported from our country is considered to be good.

Aquatic sources of leather. From early times man has utilised pelts of animals for his comfort and protection, but through all these ages practically no consideration has ever been given to the use of skins from fish. It was in 1920 that an honest attempt was made by the fishery experts to find out the sources of leather from fishes. In Europe and Japan skins of sharks, cod, skate, grouper, gar, ray, cat fish and wolf fish are being examined and processes developed to utilise the skins of these animals in the leather industry. In Travancore the skins of the members of *Elasmobranchs* and *Hypotremata* were examined and it has been found out that they are eminently suited for the purpose. However, from early days till about a century back, Travancoreans

were using the raw skins of *Elasmobranchs* for abrasive purposes, for polishing ivory and for making sword hilts. But today the methods of warfare have changed. The general military spirit and the habit of possessing a sword by the respectful gentry of the country are not now seen. Hence the manufacture of swords on a large scale in Travancore has come to a stop and thereby the utilisation of the shark's skin for making sword hilts is only an occurrence of the past. Cheap abrasives have also been introduced into the market from the west and consequently its value as an abrasive material has also become obsolete.

It is estimated that fifty to seventy five thousand rupees worth of skins can be obtained from the members of the *Elasmobranchs* and *Hypotremata*. The removal of the shagreen or the calcareous material found on the skins before they could be turned into good leather, which had been engaging the attention of scientists until recently, has been solved satisfactorily. The wearing qualities and tensile strength of the skins of the *Elasmobranchs* and members of *Hypotremata* are satisfactory. The tensile strength of the skins of these animals ranges from 3,000 to 4,000 lbs. per square inch. It is therefore believed that our fish skins could also be put to the modern use of making commercial leather.

Tortoise shells. There are three species of turtles in our waters. The edible one is known as *Chelonia mydas*, (green turtle). The shells of the logger-

Minor aquatic products from sources other than fish. head turtle (*Caretta caretta*) and the green turtle are used as ornaments in house furnishings in Travancore. Though the flesh of the Hawksbill

turtle (*Eretomus chyla imbricate*) is not commonly used as an article of food, its shell or carapace has been considered to be a valuable article even from very early days. It was considered to be so valuable that the shell was carried from India to Rome by the Egyptians as a precious substance.

The tortoise shells available in our waters are used in the manufacture of valuable in-laid works, for toilet articles, such as combs and brushes, for knife handles and for various other ornaments. The price of the shell depends mainly on its colour and it is said that a pound of tortoise shell produced in Travancore commands a higher price than a pound of elephant tusk. The carapace or the tortoise shell of commerce is removed from the live or freshly killed turtle either by immersing it in boiling water or by heating it over fire. There are thirteen plates in the carapace of the tortoise, five occupying the centre and four on each side. The carapace has also twelve pairs of marginal shields which form a strong sharp edge on the posterior half of the shell. The small marginal shields and plates of the carapace are inferior in value to the large shells. Tortoise shell is worked in the same way as ivory, but since it is more costly, greater care is being taken in its treatment. In the absence of statistics it is not possible to determine definitely the quantity of this shell collected in Travancore.

Other miscellaneous shells. Travancore has a fertile clam shell deposit. Some of the other important shells are *Cultellus radiatus* (Lin), *Trochus radiatus* (Genl), *Cardimassinite* (Reve), *Spondylus*, *Pleurotoma*, *Potamides cingulatus*, *Petella rudis* (Linn), *Tusus colus* (Lim), *Elurna*, *Zeytancia* (Brug), *Donax* (Heculia), *Scorturn* (Linn), *Tasciolania filamentosia* (Chenon), *Euchelus tricarinatus*, *Oliva gibbosa* (Born), *Cythera (crista-crycina)* (lin), *Oyster (Margaritifera vulgaris)*, *Parpura bufo*, *Harpa ventricosa* (Lam), *potamides arigulatus* (Genl), *Dolium maculatum* (Lam), *Cardita bicolor* (Lam), *Delphimula distorta* (Lam), *Bulla ampulla*, *Balamnus acorn* (Barnacle), *Bullia vittata* (Lim), *Trochus costatus* (Genl), *Turbo margiritaccus* (Lim), *Murex tenuispura*, (Lam), *Pinna fumata* (Hanly), *Murex teguliferus* (Lam) *Pirula gracilis*, *Turbinella pirum acuta* (Hornell), *Ostrea crista gilli* (Lim), *Chama*, *Ravella spinosa* (Lam), *Terebra decuplicate* (Lam), *Cypraea arabica* (Lim *Strombus*), (canarium), and *Pectar crassicostatus*.

These shells are now mostly used for making lime, though a few of them are suited for making buttons and some articles of ornaments and decorations. The total value of the shells collected in Travancore comes to nearly two lakhs of rupees.

The use of this organic product for personal adornment dates back to very early historic times. Theophrastus in his writings mentions this in the third century B. C. To ancient Gauls, coral and amber were the only costly materials to be used for jewels. In the Roman World they had many superstitions about this and thought that coral would neutralise the evil eye and cure several kinds of ailments. In the seventeenth century Tavernier, the great French gem dealer, travelled in Asia to study the value of corals.

In Travancore also coral has been considered to be a precious material from early days. It is used for making ornaments and is included in the pharmacopoeia of Indian medicine. Formerly, it was believed that coral belonged to the plant kingdom and was a peculiar sort of sea weed. But modern biologists have found that it bears no resemblance to plants except in form, and that a single complete branch of the coral bears a great number of organisms, the polyps, which form a sort of colony.

The two commercial varieties of corals are the red and the black. The black coral is more abundant on this coast than the red. It has been found to exist on the shores of Travancore mainly near Cape Comorin, Muṭṭam, Inayam and Viḷinjam. No particular fishing or dredging is being done to collect it from the sea. It is occasionally collected by the fishermen who resort to the coral reefs for fishing the "finny tribes" of the ocean. It has been found as far as eight to ten miles from the coast, from two fathoms to twenty fathoms of water. There are proofs to

show that it can be found further into the sea but the limit cannot be forecasted now.

The value of the coral collected in Travancore cannot be reliably recorded. Anyhow, the quantity is small and we do not enjoy an export trade. What is collected is being turned into ornaments, handles of knives and the like in Travancore itself. It is possible to make necklaces, bracelets arm-bands, etc., as is done in other countries. The commercial classification of our corals is as follows :—

Dead coral or rotten coral :—This consists chiefly of the lower portion of the main stem and disc like foot of the coral stock. When the outer cover is removed, valuable pieces of coral are often found. Foot plates can be worked into small dishes and plates.

Black coral :—This is important so far as Travancore is concerned. In this the black colour extends throughout the substance.

Common Red :—Red coral of all kinds. The quantity that is collected is not considerable.

It may be mentioned that the possibilities of this industry in Travancore are very limited, as a large stock of raw material can not be collected from the sea.

Other miscellaneous products within reach of fishermen. It is known that pearl essence can be manufactured in Travancore as in other countries from the lustrous scales of various fishes. As is sometimes done in Europe, in our country also it may be possible to manufacture glue from the wastes of our fishes. Cephalopod or cuttle fish, which is otherwise called “ink fish” has an ink gland from which it ejects a dark secretion to cut itself off from the view of enemies when pursued. The ink gland from the cuttle fish is removed and preserved as a raw material for manufacturing the sepia blue of commerce which is used in painting. Several species of the cuttle fish are sometimes caught in abundance in Travancore but the ink glands are not removed and preserved to be exported to

countries where they are being used for the manufacture of sepia blue.

The important chank fishing grounds of the world are located in the south Indian waters. Travancore has there-

Chank fishery.

fore the advantage of having at its doors considerable chank wealth. Chank fishing was done even so far back as the first century A. D. Chank was considered sacred and was adopted by the royal family of Travancore as their court insignia. Further, the Travancoreans believe that this symbol heralds the fame of their country and its ruler to the world at large. The chank shells that are collected in the state are exported to British Indian Provinces, especially to Bengal, where they are made into beautiful bangles and other ornaments.

Trepang is a commercial product consisting of the various species of *Echinoderm* of the group of *Halothuridae*.

Sea cucumber or
Trepangs.

The name is also applied to the living animal. The Trepang is also known as beche-de-mer. The other names of the animal are sea cucumber, cotton spinner and bot. There are several varieties of it in the Travancore waters. In colour they range from white to black. Some are smooth; others are covered with prickles. This animal when dried can be used for making a wholesome soup. The Japanese and the Chinese are fond of the soup made from this Echinoderm. Though this is not eaten by any one in Travancore at present, when fresh it is delicious and tastes like the meat of the common cuttle fish. The fishermen have understood that the flesh of this animal is edible, but it is not known when the people will actually start eating it. It is only the thin veil of sentiment that stands between this animal and the consumer.

Some sea urchins are annually collected from the rocky

Sea urchins.

portions of the coast. They are broken like a nut with some instrument and the gonads found inside are consumed by the fishermen. This is a

palatable food and is recommended by scientists as a food for people suffering from goiter and other allied diseases. But it has to be remembered that the volume of this fishery is negligible.

From what has been said about the Fisheries of Travancore it may be gathered that she keeps a store of food materials and money submerged in the fathoms of the ocean as a reserve, in the exploitation of which she proposes to get herself more interested.

APPENDIX.

The following is a classification of the important fishes that are caught in Travancore:

SUB-CLASS—*Chondropterygii*

ORDER—*Plagoistomata*

SUP-ORDER—*Selachoidi*

I. Carchariidae

Carcharias

Dussumieri

Menisorrah

Limbatus

Acutus

Gangeticus

Laticaudus

Sorrah

Zygaena

Blochii

Malleus

Tudes

Mustelus

Manazo

II. Lamnidae

Tricuspidatus

III. Scyliidae

Stegostoma

Tigrinum

Chiloscyllium

Indicum

Griseum

Sub-Order—*Batoidei*.

I. Pristidae

Pristis

Perrotteti

II. Rhinobatidae

Rhynchobatus

Ancylostomus

Djeddensis

Rhinobatus

Thouini

Granulatus

III. Torpedinidae

Spp.

IV. Raiidae

Spp.

V. Trygonidae

Trygon

Walga

Uarnak

Zugei

Sephen

Kuhlii

Bleekeri

Pteroplatea

Micrura

VI. Myliobatidae

Aetobatis

Narinari

Rhinoptera

Spp

Dicerobatis

Eregoodoo

Order—*Physostomi*.

I. Symbranchidae

Spp

II. Muraenidae

Muraena

Punctatofasciata

Pseudothyrsoidae

Tesselata

Undulata

Muraenesox

Talabonoides

Cinereus

Talabon

Ophichthys

Colubrinus

III. Siluridae

Plotosus

Canius

Arab

Clarias

Mangur

Macrones

Keletius

Vittatus

Arius

Sina

Falcarius

Macronotacanthus

Sagor

Nenga

Acutirostris

Platystomus

IV. Chirocentridae

Chirocentrus

Dorab

V. Clupeidae

Clupea

Sindensis

Ilisha

Longiceps

Fimbriata

Toli

Klunzei

Brachysoma

Kile

Variegata

Chapra

Raonda

Russelliana

Chatoessus

Chacunda

Engraulis

Mystax

Hamiltonii

- Taty gray
Coilia
 Dussumieri
Dussumiera
 Acuta
Elops
 Saurus
VI. Scopelidae
Sarrida
 Tumbil
Harpolon
 Nehereus
VII. Scombresocidae
Belone
 Annulata
 Choram
 Strongylura
Hemirhampus
 Cantori
 Limbatus
 Xanthopterus
 Georgii
 Order—*Acanthopterygii*.
I. Percidae
Lates
 Calcarifer
Serranus
 Stoliczka
 Areolatus
 Salmoides
 Diacanthus
 Angulasis
 Boenack
 Miniatus
 Guttatus

- Leopardus
 Fasciatus
 Malabaricus
 Coromandelicus
 Gilberti
 Sonnerati
Gaammistes
 Orientalis
Diploprion
 Bifasciatum
Lutianus
 Yapilli
 Argentimaculatus }
 Roseus }
Ambassis
 Nama
 Ranga
 Commersonii
 Baculis
 Thomasii
Dules
 Marginatus
 Argenteus
 Satma ? argentia }
Therapon
 Puta
 Jarbua
 Quadrilineatus
 Theraps
Pristipoma
 Commersonii
 Maculatum
 Furcatum
Diagramma
 Crassispinum

- Punctatum
Gerres
 Oblongus
 Filamentosus
 Poeti
 Setifer
 Sub-class—*Teleostei*
 Order—*Acantyoptyrygii*
- I. **Squamipinnes**
Chaetodon
 Plebeius
 Xanthocephalus
 Auriga
 Vagabundus
Scatophagus
 Argus
Ephippus
 Orbis
Drepane
 Punctata
- II. **Mulidae**
Upeneoides
 Tragula
 Vittatus
 Sulphareus
Upeneus
 Macronemus
- III. **Sparidae**
Pagrus
 Spinifer
Chrysophrys
 Datnia
 Berda
- IV. **Cirrhitidae**
Cirrhitus
 Forsteri
- V. **Scorpaenidae**
Pterois
 Volitans
 Miles
Mincus
 Monodactylus
- VI. **Nandidae**
 Spp
- VII. **Teuthididae**
Teuthis
 Oramin
 Gava
 Vermiculata
- VIII. **Berycidae**
Myripristis
 Botche
 Muradjan
Holocentrum
 Cornutum
 Maneuve
 Rubrum
- IX. **Kurtidae**
Kartus
 Indicusnale
Pempheris
 Spp
- X. **Polynemidae**
Polynemus
 Sextarius
 Tetractylus
 Heptadactylus
 Paradiseus
 Indicus
- XI. **Sciaenidae**
Umbrina
 Sinuta

Dussumieri	Armatus
Russellii	Rottleri
<i>Sciaena</i>	Malabaricus
Sina	Atropus
Carutta	Gallus
Coitar	Nigripinnis
Albida	Djedaba
Belengeri	Carangus
Miles	Boops
Axillaris	Ire
Glaucus	Crumenophthalmus
Osseus	Gymnostethoides
Diacanthus	<i>Serioliehthys</i>
Maculata	Bipinnulatus
Vogleri	<i>Naucrates</i>
Semiluctuosa	Ductor
<i>Sciaenoides</i>	<i>Chorinemus</i>
Pama	Toloo
Brunneus	Sancti—petri
<i>Otolithus</i>	<i>Trachynotus</i>
Argenteus	Ovatus
Maculatus	Russellii
XII. Xiphiidae	Baillonii
<i>Histiophorus</i>	<i>Psettus</i>
Gladius	Falciformis
Brevirostris	<i>Platax</i>
XIII. Trichiuridae	Teirà
<i>Trichiurus</i>	Vespertilio
Savala	<i>Equula</i>
Muticus	Fasciata
Haumela	Ruconius
XIV. Carangidae	Lineolata
<i>Caranx</i>	<i>Lactarius</i>
Kalla	Delicatulus
Affinis	XV. Stromateidae
Kurra	<i>Stromateus</i>

- Sinensis
 Cinerens
XVI. Coryphaenidae
 Coryphaena
 Mene
 Maculata
XVII. Scombridae
Scomber
 Macrolepidotus
Thynnus
 Thunnina
Cybium
 Interruptum
 Guttatum
 Commersonii
 Lineolatum
 Kuhlii
Elacate
 Figra
Echeueis
 Naucrates
 Albescens
 Brachycephalus
XVIII. Trachinidae
Sillago
 Sihama
XIX. Batrachidae
Batrachus
 Gangene
XX. Pediculati
Antennarius
 Hispidus
XXI. Cottidae
Platycephalus
 Macracanthus
 Punctatus

- XXII. Gobiipae**
Gobins
 Ocellatus
 Striatus
 Cristatus
Periophthalmus
 Schosseri
Eoleophthalmus
 Dussumieri
 Dantatuf
 Boddaerti
XXIII. Blenniidae
Salarias
 Periophthalmus
 Kirkii
XXIV. Sphyracnidae
Sphyracna
 Obtusata
 Jello
XXV. Mugilidae
Mugil
 Speigleri
 Parsia
 Kelaarti
 Oeur
 Borneensis
 Dussumieri
 Poecilus
 Doe mugil (?)
 Carinatus
 Sunnesius
 Balanak
 Waigiensis
 Oligolepis
XXVI. Aulostomatidae
Fistularia
 Serrata

XXVII. Centriscidae*Amphisile**Scutata***XXVIII. Glyphidodontidae***Pomacentrus**Sindensis***XXIX. Labridae***Chilinus**Trilobatus**PlatyGLOSSUS**Dussumieri**Nebulosus*Order—*Anacanthihi*

Sub-Order—

*Pleuronectotdei***I. Pleuronectidae***Psettodes**Erumei**Pseudorhombus**Arsius**Javanicus**Synaptura**Zebra**Orientalis**Plaguisia**Bilineata**Cynoglossus**Lingua**Belgalensis**Elongatus**Sindensis**Macrolepidotus*Order—*Lophobranchit***I. Syngnathidae***Syngnathus**Serratus**Gastrotoceus**Biaculastus**Hippocampus**Guttulatus*Order--*Plectognathi.***I. Sclerodermi***Triancanthus**Brevirostris**Balistes**Stellalus**Maculatus**Ostracion**Cornutus**Turrtus***II. Gymnodontes***Tetrodon**Lunaris**Oblongus**Fluviatillis**Viridipunctatu*

BIBLIOGRAPHY

- Bauder, C. S. Agar Agar to be bemanufactured in Southern California (California Fish Game 6, 1920).
- Clark, E. D. Almy L. H. and Fennington M. E. The commercial freezing and storing of fish (U. S. Department Agri. Price per cent. 35.)
- Cobb, J. N. "Increasing our Pacific Coast Fishery Resources" (California War Papers, State Council of Defence 1918.)
- Day, F. "Canning of Fishery Products Seattle 1919".
- Goode, G. B. & Associates W. S. Fishes of Malabar.
- Hornel, J. Fishes of India.
- Herdman, W. A. Fish Common.
- Jones, F. W. "The Sacred Shank of India" (Madras Fisheries Bureau Bulletin 7.)
- Kunjan Pillai, N., Dr. "Report on Ceylon Pearl-Oyster Fisheries of the Gulf of Mannar", (London 1903.)
- Laucks, J. F. "Coral and Atolls" (London 1910.)
- Narayanan Nair, A. Census Report of Travancore 1931.
- Nicholson, F. A. Commercial oils, "Vegetables and animals with special reference to Oriental oils" (New York 1919.)
- Rogers. Fisheries in Travancore, (Guide and Hand book Sri Chitra All India Exhibition 1936.)
- Sankaranarayana Pillai, R. "Note of Fisheries in Japan" (Madras 1907.)
- "Industrial uses of the shark and porpoise" (Chem. Eng. 27 1919).
- A list of fishes taken in Travancore from 1901 to 1915, (Journal of the Bombay Natural History Society. Vol. XXXIII.)

BIBLIOGRAPHY (*continued.*)

Smith, H. M.

"The Fisheries of Japan" (Natural Geographic Magazine 16, 1905).

Smith, W. A.

Seaside Economy Paisley.

Stevenson, C. H.

"Aquatic products in Arts and Industries" (W. S. Fish Comm. Report 1902).

Commerce Department of Foreign Trade in Buttons.

(Bureau of foreign and Domestic commerce special consular Reports No. 75, 1916).

Madras Fisheries Bulletins. (Government Press, Madras).

CHAPTER XX

MEANS OF COMMUNICATION.

Travancore has an almost uninterrupted line of natural communications in its extensive river and backwater systems. Transport by water appears to have been in vogue from very early times. There were also numerous foot-paths and bridle-paths in almost all parts of the country : nor were roads wanting which gave facilities to the march of large armies.

The first mention of the adoption of a deliberate policy of opening new roads of the modern type is in 926 M. E. (1750-51), during the reign of Mahārāja Roads. Mārthāṇḍa Varma. Several good roads and water communications were opened. It was then in his reign that the canal which connects the backwaters of Quilon and Kāyamkuḷam through Chavara and Panmana and the one by which the Kārthikappally river is joined with the Kāyamkuḷam lake were constructed. So also was the Paṭavūr Canal. Fra Barthalomew mentions a beautiful road between Cape Comorin and Koḍungallūr during the time of Rāma Varma (1758-1798). This road was provided with rest-houses throughout the entire length.

Lieuts. Ward & Conner mention the following routes in their survey:—*

1. The route from Paṇaguḍy to Trivandrum, via., Aramboly and thence to Quilon (length 102 miles).
2. The route from Quilon to Shenkōṭṭa, via., Koṭṭārākara and the Ārienkāvu Pass (length 59½ miles).
3. Route from Quilon to Cochin, via., Alleppey and Shērthala in the interior (length 92 miles).

* Memoir of the Survey of Travancore and Cochin.

They also make mention of the following less important routes:—

1. Route from Quilon to Īrattupēṭṭa, via. Rānni and Kānjirappall̥y (length 69 miles).

2. Route from Panthalam to Paṭhanāpuṛam (length $16\frac{1}{2}$ miles).

3. Route from Krishnapuṛam to Changanāśśēry, via., Māvēlikara and Thiṛuvalla (length 25 miles).

4. Route from Kārthikappall̥y to Achenkōil Pass, via., Māvēlikara, Panthalam, and Kōnniyūr (length $55\frac{1}{2}$ miles).

5. Route from Changanāśśēry to Peruvanthānam, via., Kānjirappall̥y ($42\frac{1}{2}$ miles).

Besides these there were primitive foot-tracks connecting the various districts of the State. Through traffic was difficult, inconvenient and expensive even in the better class of roads. They were intersected by numerous streams and channels. There were practically no bridges. The few that existed were of rough construction and did not permit any wheeled traffic. The condition of the State finances did not justify any large outlay of capital for improving the communications. Until the dewanship of Sir Mādhava Row the efforts made by the Government in the direction of opening and improving communications were spasmodic. The Department of Public Works was organised in 1860. But it was only in 1863 that any substantial work was commenced. In that year, Mr. Barton was appointed Chief Engineer of the State. From the engineering point of view Travancore was a virgin field. The following extract from the Administration Report describes the state of the communications at that time:—

“There is ample scope for the exercise of the most versatile talents. Roads, bridges, canals, reservoirs, anicuts, harbours, wharfs, works of drainage as well as of irrigation works, jails, hospitals and public offices, and palaces setting an example to the country of some beauty and elegance,

have to be constructed in a long succession in the order of their respective importance to the country. The benefits sure to follow the opening up of the country by means of short roads from the base of the ghauts to the coast must alone be incalculable. Parts of the country present admirable facilities for a net-work of canal communication. As it is, many parts of the country are sandy, deficient in communications, though it is true that we have about 500 miles of good road and canal communication. The deficiency in question is so great that many foot paths are impracticable even for horses or palanquins and compel the traveller to resort to the most primitive of all means of locomotion."

Good progress was made in road construction in the course of ten years, 1038-1047 M. E. (1862-1872 A. D.).

The Main Southern Road from Trivandrum to Aramboly (52 miles), which was in a very bad condition was the first to be taken up for improvement. The road was not only maintained in excellent order at considerable cost but several improvements were made by suitable deviations and new alignments. Within a short time the roads throughout the State were all restored to good order and made available for cart traffic. Several new roads were also undertaken.

By 1049 very satisfactory progress was made in the way of opening up the country in all directions. Trade began to increase. A beginning was made for a new road from Trivandrum passing through the central part of the Quilon division and reaching Kōṭṭayam with a view to extend this through North Travancore, the old route being most tortuous and perfectly impassable for carts. The road was designed in such a manner that communication between inland towns and waterways was rendered easy.

In 1052 M. E. (1876-77), 45 miles of road, commenced in previous years, were brought to completion; 100 miles of new roads were commenced and 136 miles of traces for new roads opened. The road from Pīrnēde to Guḍalūr, which was already opened for cart traffic, proved specially,

useful during the famine of 1876. The produce of North Travancore found a ready outlet to the Madura district.

The main road from Kōṭṭayam to the Cochin frontier, the first section of which had already been commenced in 1051 (1875-76), was taken up the next year in its entire length and was completed in 1053 (1877-78) A. D. This completed the main line of communications from Trivandrum to the northern frontier. This is called the Main Central Road. The total length of the road is 156 miles. Simultaneously with the construction of this road, traces for new roads running to the coast and to the foot of the hills on the east were also laid out. A new road from Vempāyakkōṇam to Neḍumangād, Āryanād, Munarray and Kaliel and thence to Kulaśēkhaṇam and Shorlacōde (length 45 miles) was taken in hand, as also another road from Kānjirappall̥y to the river bank at Cūnumbhāgam. While the former was intended to serve as a connecting link inland between the Trivandrum and the Southern divisions, following close along the foot of the hills and giving ready access to the various routes which led to the coffee estates on the hills, the latter, though only seven miles in length, formed a link between the Quilon and the Northern division systems of roads inland, at the same time shortening by fifteen miles the distance between the coffee estates and the water communications. These two roads were completed and opened in the course of one year.

And lastly, several short lengths of useful roads were opened in the Trivandrum town. In 1053 (1877-78) eighty three miles of roads were brought to completion and ninety six miles traced for new roads. In 1054 (1878-79), in addition to the roads already in progress, two branch roads connecting Quilon and the Varkala cliff with the main line of communication between Trivandrum and Shenkōṭṭa were proceeded with. Several roads were also opened about Trivandrum and the old road between Trivandrum and Quilon was rendered trafficable for nearly two-

thirds of the whole distance. By the end of 1055 M. E. (1879-80 A. D.) the Northern division which up to a few years previously had absolutely no cart tracks save the line from Kōṭṭayam to Muṇḍakkayam, via., Kāñjirappall̥y had been opened with nearly 241 miles of road fit for cart traffic and with several miles of traces. The total length of roads maintained throughout the State at this time was 950 miles, which in another five years increased by 200 miles. Since then a steady policy in the matter of road construction has been followed. In 1111 M. E. the total length of roads newly opened and improved was 3,479 miles of main roads, 1,017 miles of village roads and 411 miles of traces. The following statement gives details about the principal roads in the State at the end of 1111 M. E.

Principal Roads.

No.	Name of Road	Length in miles	No. of branch roads	Travellers' bungalows	Camp shed	Sathrom	Anchal Office	Post Office	Telegraph Office	Police Station	Markets.
1	M. C. Road from Trivandrum to northern frontier	155	94	5	5	7	14	7	7	6	7
2	Main Southern Road from Trivandrum to Aramboly ($53\frac{5}{8}$ miles) and thence to Tinnevely (93 miles).	$53\frac{5}{8}$	64	4	2	5	12	5	4	7	5
3	Trivandrum-Shenkōtta Road	$64\frac{1}{4}$	19	2	3	3	4	2	1	2	...
4	Trivandrum-Quilon Road	$44\frac{1}{4}$	24	1	1	...	5	2	1	3	2
5	Quilon-Shenkōtta Road	$59\frac{5}{8}$	25	3	2	2	6	3	2	2	3
6	Neḍumangād-Shōrlacōde Road	39	7	1	3	1	3	1	...	2	...
7	Quilon-Alleppey Road	$53\frac{1}{4}$	10	1	1	1	5	1	1	2	2

Principal Roads. (concluded)

No.	Name of Road	Length in Miles	No. of branch roads	Travellers' bungalows	Camp shed	Sathrom	Anchal Office	Post Office	Telegraph Office	Police Station	Markets.
8	Kāyamkuḷam-Punalūr Road	35	15	3	..	2	4	2	..	3	2
9	Paṭhanāpuṭam-Rānni Road	24½	6	1	1	..	3	1	..	1	3
10	Alleppey-Arūr Road	29	1	1	..	..	2	1	..	1	..
11	Cape Road from 41st mile, M. S. Road to Cape Comorin	13	17	2	..	2	3	..	..	1	1
12	K.K. Road, 70 miles. From Kumili to Amayanāyakkannūr 76 miles)	146	20	3	..	3	7	6	4	3	2
13	Alwaye-Mūnnār Road	71½	13	1	4	1	2	2	1	1	..
14	Changanāssēry-Pīrnēde Road	48	..	1	..	..	1	1	1	..	..
15	Northern Outlet Road (Mūnnār to Chinnār)	36½	5	2	2	1	2	2	1	..	..

Besides there are about 300 roads varying in length from ½ mile to 25 miles, over and above estate roads, bridle paths, etc.

All the important roads are metalled and some of them tarred. As an experimental measure, a cement concrete road was constructed in 1108 in a portion of the Trivandrum-Shenkōṭṭa Road inside the Trivandrum Town, between the School of Arts and the L. M. S. Church Junction. That portion of the road was selected as it was thought fit to try the experiment in a locality where there was heavy traffic. In 1109 a part of the road near the Railway Station at Quilon was also similarly treated. A portion of the Trivandrum-Shenkōṭṭa Road between the Vellāyampalam Junction and the Kauḍiyār Palace was converted into a wide Avenue Road. The roads in Quilon, Kōṭṭayam and Nāgercōil are lighted by electricity.

Till recently the Government was solely responsible for constructing and maintaining the roads in the State; within the past few years, however, a few municipalities have taken over the maintenance of non-arterial roads within the municipal limits. The Government pays grants to them on a sliding scale, the grants ceasing in five years. There is also a system of ryots' roads under which the roads are opened by the people themselves. Land is acquired under the Land Acquisition Regulation for this purpose. The Department of Public Works advises alignment and constructs the necessary bridges and culverts. These roads, if satisfactory, are subsequently taken over and maintained by the Government. The existing road system is well co-ordinated. There are main arterial roads throughout the length and breadth of the State, to which are linked a network of subsidiary and feeder roads. All the internal waterways and the ports are also connected by roads. Roads have also been constructed to open up and serve important planting areas and industrial centres. They connect the State with the lines of communication in the adjoining British territory and the Cochin State.

The construction and maintenance of roads is financed by the Government, the funds being made available from

the general revenue. From 1107 Travancore began to get a subvention from the Government of India on account of the additional income derived by that Government by the enhancement of the duty on petrol. The amount received by the Travancore Government as its share for 1107 came to Rs. 2,76,857. In the first instance the amount received on this account from the Government of India was credited to the general revenues. But subsequently a separate account called the Road Development Fund was opened in 1108 with a sum of Rs. 1,68,906, the balance of the two subventions received till then, after crediting a portion to the general revenues of the State. A programme of works on which the subvention amount is to be spent is being submitted every year to the Government by the Chief Engineer. The unspent amount of a particular year under this fund is carried forward to the next year. The fund is administered by the State Account Officer and is earmarked to be used for the construction of bridges.

With the steady increase in the length of roads every year, the demand for more roads has also been persistent. The distribution of public funds for the purpose is now made with regard to the comparative urgency of road construction in different localities. A Road Board, to advise the Government and the Public Works Department in the matter of opening, improvement and maintenance of roads, bridges and waterways in the State, was sanctioned in 1105. Accordingly, a Central Board with headquarters at Trivandrum and six District Boards, one for each of the P. W. divisions, were established. The Central Board was composed of the heads of the P. W., Land Revenue, Forest and Agricultural Departments, the Commissioner, Devikulam, and the Executive Engineers in charge of the divisions. The legislature also elected some members to the Board. The Boards functioned for two years, when it was found that the Government would not be able to finance the construction of the large number of roads

recommended by them. In 1107 the meetings of the Board were suspended. The recommendations already made by the Board are before the Government and are taken into consideration in the programme of road construction.

Travancore is represented on the Board of India Road Congress, which has been inaugurated by the Government of India to promote the science and practice of road construction and maintenance by annual meetings for the discussion of papers and inspection of works of interest.

The expenditure incurred in the construction and maintenance of roads and bridges was so heavy at all times that the question of raising a fund to meet the expenses under these heads by some kind of taxation attracted the attention of the Government. The imposition of tolls was decided upon, though at one time the Government had expressed itself emphatically against the levy of tolls. A toll was established in 1056 M. E. at Kulithura on the construction of the bridge. In course of time the toll system had to be extended to the other parts of the State. As it was found that the expenditure on roads was on the increase year after year, it was considered desirable to levy a moderate toll on at least newly made roads and bridges. The Tolls Recovery Regulation was passed defining the procedure for the realisation of tolls on the public roads and bridges. This was amended in 1098 making provision for the punishment of wilful evasions of the payment of tolls. As a result of this measure, toll gates were established in 1087 on the Main Southern Road, the Kōṭṭayam-Kumili Road and the Quilon-Shenkōṭṭa Road.

The system of levying tolls on traffic has since then been extended throughout the State on all important roads, such as,

1. The Northern Outlet Road.
2. The Main Central Road.

3. The Kōṭṭayam-Kumili Road.
4. The Quilon-Shenkōṭṭa Road.
5. The Trivandrum-Quilon Road.
6. Do. -Shenkōṭṭa Road.
7. The Alleppey-Quilon Road.
8. Do. -Arūr Road.
9. The Vaikom-Udayampērūr Road.
10. The Muvāttupulā-Munnār Road.
11. The Main Southern Road.
12. The Nāgercōil-Cape Road.
13. The Colachel-Parassēri Road.

There are now 21 toll gates which yielded a total revenue of Rs. 5,70,000 in 1113. At first the toll collection was conducted by the officers of the Public Works Department, but from the beginning of 1089 it was leased out in open auction. The toll gates except those at Paḷḷikkaviḷa and Nīṇḍakara consist of one or more main gates and one or more subsidiary or check gates some of which are on roads leading to the main roads. A vehicle passing through all or any number of these gates the same day need make only one payment at the first gate it crosses, and it will be allowed free passage at all the other gates of the same toll gate the same day if the pass obtained at the first gate is shown. For this purpose, a day is reckoned as commencing from sunrise and ending at sunrise the next day.

As persons residing near the toll gates will have to cross them daily or perhaps several times a day, and as the imposition of daily toll on their vehicles at the usual rates will be hard, a concession is allowed to such persons as regards payment of tolls at the toll gates near their residence. A bona fide resident is entitled to obtain for the vehicle or animal kept or maintained for his domestic or private use, as opposed to business or commercial use, an annual pass enabling the vehicle or animal to pass

through all the gates of one toll gate situated within a radius of three miles of his residence. Such a compounding pass can be obtained from the lessees of the different toll gates on payment to them of the annual compounding fee, which is twenty one times a day's toll for the particular vehicle or animal, and on production by him of a certificate from the Tahsildar of the taluk in which the inhabitant resides, certifying that the applicant is a bona fide inhabitant, that the vehicle or animal for which the pass is applied is kept or maintained for his private use, and that all the gates mentioned in the application are within three miles radius of the residence of the applicant. A compounding pass so obtained will be in force till the last day of the Malabar year in which it is obtained.

The existence of a toll gate at a place is signified by a notice board. The toll gates are under the control of the officers of the P. W. D. within whose jurisdiction the gates are situated.

The following are the vehicles exempted from the payment of toll :—

(a) Vehicles conveying the Royal Personages of Travancore,

(b) Vehicles and animals belonging to the Resident for the Madras States and the Indian Assistant to the Resident for the Madras States and the Madras State Residency Motor Lorry.

(c) Steam or motor road rollers and trailers attached to them, hand carts, water carts, bullock carts, cycles, steam or motor tractors, engines and pumps, elephants and all other vehicles and animals belonging to the Government of Travancore.

(d) The State motor cars of the Dewan of Travancore and all other Travancore State motor cars.

(e) The State motor cars belonging to the Cochin Government.

(f) Vehicles and animals belonging to the members of the Indian Auxiliary Force stationed in Travancore, other than Reservists of A. F. (i) Unit, while they are used by the members in their capacity as such and when they are in uniform and are travelling on duty.

(g) The ambulance car of the Salvation Army, Nāgercoil.

(h) The elephants belonging to the Dēvaswom Department.

(i) Vehicles and animals belonging to the P. W. D. gazetted officers and section officers within their jurisdiction.

(j) Vehicles and animals belonging to the Ruler of Sandur and his personal suite.

(k) Vehicles and animals belonging to the Commandant and Adjutant of the Nilgiri Malabar Battalion Auxiliary Force (India) while travelling in uniform and on duty.

(l) Vehicles and animals belonging to the Cochin police officers while travelling in uniform and on duty.

The water communications consist chiefly of a series of natural reservoirs formed along the sea coast by inland drainage, penned back by sandy barriers thrown up by the peculiar action of the sea, these reservoirs being connected by short lengths of artificial canals. The canals are cut for the most part through drift sand and are constantly subject to being silted up by side drainage. Shoals are formed very often causing great impediment to traffic. An enormous expenditure is incurred annually in preventing this. Rivers also furnish water communication.

A series of canals unite the different lakes which run more or less parallel to the coast, thus forming a waterway along the entire length of the country from Trivandrum northwards. The importance of connecting the backwaters by canals in order to procure as far as practicable an

uninterrupted line of water communication from Trivandrum to the northern districts was first appreciated and acted upon by Dewan Venkīṭa Rao. The first canal opened was the one between Chānnānkaṛa at the southern turn of the Anjengo Lake and the landing place at Trivandrum. This made water communication possible from Trivandrum up to the Varkala cliff. The second was the Paṛavūr Canal two miles long, connecting the backwaters of Eḍavā and Paṛavūr. The Quilon Canal connecting the Paṛavūr and Aṣṭamuḍi lakes was also constructed about the same time. Then comes the Chavara Canal connecting the Aṣṭamuḍi and the Panmana backwaters. There is another canal of importance connecting Alleppey with the backwater, a distance of about $3\frac{1}{2}$ miles. This is called the Commercial Canal.

The Anantha Victoria Mārthāṇḍa Varma Canal was started in July 1860. This was a scheme for connecting Trivandrum with the Cape and thus extending the water communications to the extreme south of the country. The section first undertaken was only a short link of that communication. By 1042 the section between Pāvār and Coḷachel was completed. However, it was resolved to suspend the work since the work of the Varkala Canal was started. For a long time no attempt was made to revive the project. A short distance from Trivandrum to Thiruvallam was, however, taken up and finished a few years hence.

The Varkala Barrier Canal was an expensive and difficult undertaking. It took nearly nine years for the Government to come to a decision regarding this project. The scheme was intended to complete the water communications from Trivandrum to the railway station near Beypore, a distance of 228 miles. It consisted of open cuttings and two tunnels, one of 1,000 feet and the other 2,500 feet. The open cuttings were first completed. Tunnel No. 1 was opened to traffic on the 15th January 1877. Tunnel No. 2 was completed and opened to traffic in 1880.

No new canals were undertaken for some time. The attention of the Government was drawn to the necessity of digging and improving the canals in other parts of the country as well. The work of restoring the Arūkutty Canal was completed in 1686. The Alleppey-Shērṭhala Canal which was the subject matter of important discussion for so many years was begun in 1087. The entrance to the Vāḍai Canal from the mouth of the Pallāṭhūrathi river was completed next year. The scheme of the Alleppey-Shērṭhala Canal was subsequently given up in favour of that of the Alleppey-Shērṭhala Road. Since then there has been no scheme of new canals. But every year some amount is being spent on canal maintenance. The following is the list of canals with their lengths in 1113 M. E.

Canal Communications.

No.	Name.	Length in miles.
1.	Alleppey-Ampalapūḷa	7
2.	Do. -Changanāśśēry	19
3.	Do. Commercial Canal	2 $\frac{1}{4}$
4.	Do. -Kōṭṭayam (via. Backwater)	17 $\frac{5}{8}$
5.	Do. Palace Canal	$\frac{3}{4}$
6.	Do. -Thalavaḍy	22
7.	Do. Vāḍai Canal	2
8.	Do. West Junction Canal	$\frac{3}{8}$
9.	Alwaye-Erṇākuḷam	20
10.	Ampalapūḷa-Porakkāḍ	3 $\frac{1}{4}$
11.	Anchumana Canal	1 $\frac{1}{2}$
12.	Aruthutty Canal	2 $\frac{1}{2}$
13.	Arūkutty-Thaṇṇīrmukkam	18
14.	A. V. M. Canal	8
15.	Changanāśśēry-Kōṭṭayam	12
16.	Changanāśśēry Salt Bankshall Canal	$\frac{1}{4}$
17.	Chenganda River	1
18.	Chengannur-Kaipūḷa	16
19.	Dāṇṇapaṭikkal Canal	7

No.	Name.	Length in miles.
20.	Desuthōḍu	8
21.	Kakkāḷam Canal	$\frac{3}{8}$
22.	Kalpālakkaḍavu-Kōvaḷam	$6\frac{1}{2}$
23.	Kanḍanād-Vaikom	15
24.	Kaṛippuḷa Canal	5
25.	Kāyamkuḷam Salt Bankshall Canal	5
26.	Kōṭṭayam-Vaikom	$16\frac{1}{2}$
27.	Kuṭhiya Thōḍu Canal	$\frac{3}{4}$
28.	Maṇṇanchēry-Vēmpaṇād Lake	1
29.	Maṛamvīṭṭil Canal	$1\frac{1}{4}$
30.	Mahomma Canal	$\frac{3}{8}$
31.	Mūvāttupuḷa-Vaikom	41
32.	Pūcchākkal Canal	$1\frac{1}{4}$
33.	Pāvār-Thēngāppaṭṭaṇam	8
34.	Erakoḍikkaḍavu (Ampalapuḷa)	$1\frac{1}{2}$
35.	Puṭhenthōḍu-Thaṇṇīrmukkam	1
36.	Trivandrum-Trichūr-Shōrnūr	198
37.	Veluṭhulḷy Canal	3

The maintenance of the backwater route is governed by the Travancore Public Canals and Public Ferries Regulation VI of 1096 and the rules framed thereunder. The working of the above Regulation and the rules and the control and regulation of traffic in the public canals devolve on the officers of the P. W. D., the Chief Engineer being the ultimate controlling officer. The Assistant Engineers, Sub-Engineers, Supervisors, Overseers and Lock Superintendents are ex-officio Canal Officers working under the respective Executive Engineers of Alwaye, Kōṭṭayam, Quilon and Trivandrum; and they are empowered to regulate and control traffic and to stop any vessel from navigating, etc. The licensing and registering of vessels are being attended to by the Canal Supervisors at Trivandrum, Quilon, Kāyamkuḷam, Alleppey, Vaikom, Shērṭhala and Parūr. Besides the above officers, the Lock-Superintendent, Thōṭṭappally, is also empowered to issue licenses for rafts.

As per the provisions of the above Regulation and rules, every steam or motor boat, country crafts or vallams and rafts navigating in the above public canals have to be licensed or registered according to the rules laid down by the Government except

1. vessels belonging to the Palace and the Travancore Government,

2. vessels that have been licensed or registered in Malabar under the provisions of the Madras Act II of 1890,

3. vessels licensed or registered in Cochin under the Cochin Regulation I of 1092 as amended by Regulation X of 1095,

4. vessels belonging to the British Government, and

5. vessels less than one ton registered tonnage.

In the case of vessels registered or licensed in Cochin or Malabar, they will be exempted from licensing in this State only if the owners of those vessels reside or have their principal place of business in those districts and only if they do not ply for service exclusively within Travancore limits. Vessels plying for public passenger or goods service or for purposes of trade have to be licensed annually, while vessels, other than steam vessels, need be registered only once so long as the person in whose name it has been registered continues to be the owner. The licenses of steam vessels and country crafts are current for one year, while the licenses of rafts are current only for six weeks.

The steam vessels navigating in the waters of the State have to be subjected to half-yearly inspections by the Superintendent, Workshops and Stores Division, and the Principal Port Officer, the former regarding the fitness of the engine, etc., of the boats for service and the latter regarding the stability and equipment of the vessels. The inspecting officers certify that the vessels are fit for service for six months. The certificates are issued twice annually, viz., on the 1st Chingam and on the 1st Kumbham for the first and second half years. The licenses of steam vessels

are issued only on the production of such certificates. Although the licenses for steam vessels are to be in force for one year, they will cease to be current when the period of the inspection certificate expires.

All steam vessels used for service should be manned by the required competent crew, viz., master, driver and syrang, who have undergone the necessary examination and obtained certificates of competency from the Chief Engineer. The examination of the boat crew is conducted by the Superintendent, Workshops and Stores Division, once in six months at Alleppey, Quilon and Trivandrum. The certificates of competency of the boat crew are liable to suspension or cancellation by the Chief Engineer for misconduct or default in the discharge of duties. The owners of motor boats wishing to drive them personally and solely for their personal use are not required to take a driver's competency certificate.

Steam vessels intended to ply for hire have, in addition to the licenses, to obtain timings, similar to the "G" permits in the case of buses, from the Executive Engineer, for plying for service between the different places, fixing the hour of departure from the starting station and the hour of arrival at the terminal station, before putting the vessels into service. The timings granted are published in the Government Gazette. Copies of the timings will be posted in the vessels and at the different jetties. A timing once granted will not ordinarily be altered for six months. The boats are required to adhere strictly to the timings; and any timing not utilised for three days consecutively or utilised for less than twenty days in a calendar month is liable to be cancelled, unless such failure is caused by unavoidable circumstances explained to the satisfaction of the officers concerned.

Steam vessels intended for public passenger service are required to touch the jetties or wharves on the route. Jetty maistries are appointed at these jetties to control

and regulate the traffic at the jetties and to see that the boats conform to the rules in the matter of the number of passengers, cargo carried, time of arrival, etc. Vessels are prohibited from embarking or disembarking passengers from places other than recognised jetties. While issuing certificates of inspection of boats, the number of passengers or the quantity of goods each vessel is considered fit to carry is fixed. Overloading is punishable.

There are no rates of fares authorised or prescribed by the Government. Owners of vessels wishing to run their boats for passenger service prescribe a list of fares for the several classes between the terminal and each of the intermediate stations and submit it to the Executive Engineer. The fares charged for the same route by different boat owners may therefore differ. But no boat owner shall collect fees in excess of the fees prescribed by him. Any intention of an owner to change the rates of fares once fixed should be intimated to the Executive Engineer seven days in advance. The number of country crafts licensed at the end of 1112 M. E. was 9,100 approximately.

The backwaters of Travancore, Cochin and Malabar are inter-connected and there is considerable commercial intercourse among these states. There is therefore a mutual understanding recognised by the three states that the vessels registered or licensed in one state need not be registered or licensed in the other states, subject to the conditions (1) that the vessels shall be registered or licensed in the state in which the owners reside or in which they have their principal place of business, if they reside in more than one area, and (2) that the vessels do not ply for service exclusively within the limits of one territory, in which case they shall be licensed in that state. There is also another mutual understanding that vessels which have to be licensed in one state as per the above principle shall be allowed to ply in the waters of the other states during the

first month of the year even if they do not possess the licenses or registration certificates for that year, in order that those vessels may be allowed one month's time to take out licenses or registration certificates from the state to which they belong. The inspection certificates of one state as to the fitness of boats are also recognised by the other states. The punishments inflicted on the boat owners or the boat crew by any one state are also enforced in the other states.

The total number of ferries maintained in the State at government cost is 268, of which 67 are in the Alwaye P. W. D. division, 100 in the Kōṭṭayam division, 85 in the Quilon division, 11 in the Trivandrum division and five in the Nāgercōil division.

The construction of numerous bridges has greatly added to the facilities of communication. Many of the more important bridges are of reinforced concrete. The first concrete bridge was erected in 1075. The Public Works Department has earned a reputation for high efficiency in concrete work. One of the earliest bridges built of brick and mortar is that over the Kaṛamana river at Trivandrum. The foundation stone of the bridge was laid by His Highness Swāthi Thirunāl and the opening ceremony performed by his successor, His Highness Uthram Thirunāl in 1853 A. D. The Punalūr Suspension Bridge was commenced in 1047 M. E. and completed in 1054. The following are some of the important bridges constructed during that period :—

The Massapeṭṭayār Bridge.

The Ayrūr Iron Girder Bridge on the 35th mile of the Main Central Road.

the Periyār Bridge.

The Vāḍay Bridge, and

The Iron Girder Bridge across the Bhavānīpuram river in the Main Central Road. The important bridges under construction in 1074 were

1. The Iron Girder Bridge across the Vāmanapuram river at Pāvampāra.

2. The bridge across the Kaṣamana river at Kundāmkaḍavu.

3. The bridge over the Paṣappūr river.

4. The bridge over Cherukōlpūla thōḍu.

5. The bridge over the Ēnāthu river.

6. The bridge across the Paḷayār at Oḷuginaśēry.

The bridge over the Peṛiyār in the Kōṭṭayam-Kumili Road was completed in 1084 M. E., and the bridges in the Vaḍayār Road and that on the 1st mile of the Mūvāttupūla-Thoḍupūla Road were completed in 1092. In 1095 the construction of the bridge over the Rānni river at Chengannur was begun. In 1103 there were in all thirty two principal bridges and eight bridges were under construction. In 1105 the Niṇḍakara Bridge was completed and the Nēriamangalam Bridge was completed in 1109.

A short account of some of the reinforced concrete bridges is given below:—

The Sinclair Peṛiyār Bridge.—This is the first bridge of magnitude which was constructed of reinforced concrete. The bridge is situated at Sinclair Peṛiyār on the Western Ghats, a few miles below the big Peṛiyār Dam. The bridge was designed by the late Mr. A. H. Bastow. The reinforced concrete work is confined to the arches and the slab floor over haunches. It is monier material, i. e., a one to three mixture of cement and sand, with two grills, an upper and a lower, both alike, longitudinal bars $\frac{3}{8}$ " round rods spaced 5 to the foot and transverse bars $\frac{1}{4}$ " spaced 4 to the foot. The arches are given a circular curve.

The Kuḷiṭhura Bridge.—The old bridge at Kuḷiṭhura was designed by Chief Engineer Mr. Barton and was sanc-

tioned in April 1867 A. D. The iron works were supplied by the Consulting Engineer, George Wells, London. The construction of the bridge appears to have taken four to five years and the bridge was opened to traffic in the beginning of 1872 A. D./1047 M. E. The old bridge had a light wooden floor supported on three girders of the Warren type over all the eleven spans, carrying a roadway 22 feet wide. In 1893 it was found that the wooden platform was not strong enough for heavy traffic and the whole of the wooden platform in the nine eastern spans was replaced by steel trough flooring. Since then the conditions of traffic had changed considerably. Steam road rollers began to be used in the State in 1072 M. E. In 1911 the use of the steam car of Messrs. Brunton, the motor buses and the demand made by the Forest Department for the passage of the traction engine over the bridge made the question of the strength of the bridge, then forty years old, a very important one to consider, and Mr. Bastow examined the bridge in September 1911. He found that most of the girders had, in spite of the paintings applied now and then, severely rusted and that the outer girders especially had been affected by exposure. A temporary causeway was therefore proposed to carry the traffic during the ordinary season and the question of a permanent new platform was taken up. The platform of the bridge was reconstructed. The design adopted consisted of four girders 60" deep and 20" thick and 5'-6" centre to centre with a slab 8" thick. The slab cantilevers on each side are 3'-9" from the centre of the outside girder and are 4½" thick at the edge. This edge is to carry the parapet consisting of pilaster, one over every pier and pierced panelled work between.

There was at that time no reinforced concrete girder bridge in South India, which was comparable in span or total length to this. Of platform bridges supported on girders, examples even outside India were comparatively few. There were, as far as figures are available, spans of

plain beams standing 75 feet in Pennsylvania, America, with a depth of girder of 7', while there were a few more instances of girders of spans about 50' in other parts of America.

The Mūvāttuṇṇa Bridge.—This is on the 131st mile, Main Central Road. It consists of three spans, two end spans 100 ft. each and a centre span 110 feet, the rise of each being $\frac{1}{5}$ of the span. Two arch ribs each $2\frac{1}{4}'$ wide \times $2\frac{1}{2}'$ deep at crown and $2\frac{1}{4}'$ wide and 4 ft. deep at springing carry the road way. The width of the road way is 16 feet clear between hollow longitudinal curbs 2 ft. 3" broad and 1 foot high. The bridge was designed by Mr. A. H. Bastow and the work was carried out by Mr. R. Everard under the direction of Mr. F. J. Jacob, then Chief Engineer. The bridge work was started by about the middle of 1911 and completed and formally opened for traffic on 9th the December 1914. The total expenditure on the work was 2.80 lakhs of rupees.

This bridge is one of the most beautiful reinforced concrete arch bridges in South India and was constructed at a time when reinforced-concrete construction was not well understood in India.

The Erappuṇa Bridge. The Erappuṇa Bridge, popularly known as the Chengannūr Bridge, is another reinforced concrete bridge at Chengannūr and is on the crossing of the Pampayār river at the 76th mile of the Main Central Road from Trivandrum, to the northern frontier adjoining the Cochin State. The bridge is of open spandrel type consisting of three clear spans each of 120 ft. Each span has two ribs 2 ft. wide, rectangular in cross section, and spaced at 10 feet centres. The depth of the rib varies from 3 feet at the crown to 7 feet at the springing. The bridge has a 15 feet clear roadway.

The bridge was designed by Mr. A. H. Bastow, Chief Engineer, who retired soon after the commencement of the work and was completed by his successor, Mr. F. J. Jacob,

The Executive Engineer in charge was Mr. L. H. Jacob and the contractor Mr. G. Marini, Engineer and Contractor. The work was commenced on 26-10-1917 and the bridge opened to traffic on 22-8-1921 with a capital outlay of Rs. 3.75 lakhs.

The Nēriamangalam Bridge. The construction of the Nēriamangalam Bridge across the Peṛiyār river at the 20th mile, 4th furlong, of the Mūvāttupūla-Mūnnār Road, at the foot of the Ghat Road, known as the Nēriamangalam-Pallivāsal Road, marks the forging of the last link in the chain of communications for an outlet to the west coast from the High Ranges. It is practically an all-concrete structure of five bow string arches each of 132 ft. span by 29'-6" rise and 72 ft. long end to end of parapets with a clear roadway of 16 feet, and is the largest of its kind in Travancore. The foundations were constructed in open excavation except for the left abutment. In the case of this abutment investigation showed that no rock existed even up to 98 feet below ground level. Soft rock was found at about 44 ft. below ground level, but the bearing capacity of this was insufficient to carry the load. Investigations were carried out by means of an open excavation to the soft rock level and subsequently by means of a Calyx Drill. Due to consequent heavy cost of shoring for this foundation a monolith was sunk. This is of mass concrete reinforced at points. The overall dimensions of this monolith was 68' \times 40' \times 30'. This is believed to be the largest monolith ever sunk in India and probably one of the largest in the world.

The platform is on an average 58 ft. above the bed of the river and 79 ft. above the deepest foundation from which the extreme height to the crown of the arches is 105 ft. The wearing surface of the road is of concrete 4½" thick separated from the platform slab by a thin coat of bituminous paint.

The work was carried out by contract through the agency of the General Construction Co. of Madras by their Resident Engineer, Mr. Hodgson, under the supervision

throughout of the Division Officer, Mr. M. P. Mani, guided by the successive Chief Engineers of the P. W. D., Messrs. L. H. Jacob, J. S. Westerdale, and G. B. E. Truscott. The work was commenced in November 1932 and completed in February 1935 with a total estimated expenditure of 4.40 lakhs of rupees, which works out to nearly rupees 570 per running foot.

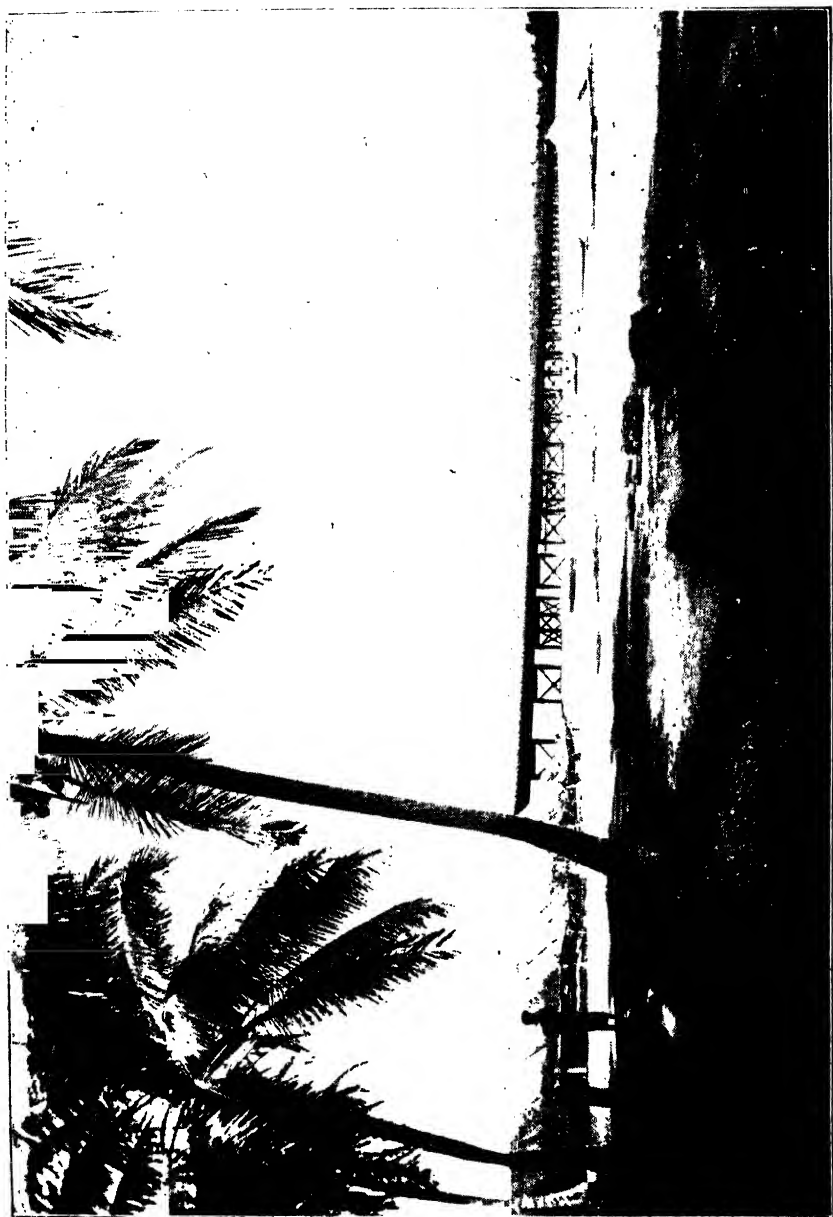
The work being a crowning achievement in one of the most important schemes of road development in Travancore, it was declared open to traffic by His Highness the Mahārāja on the 2nd of March 1935.

The completion of this bridge marks the close of the final stage of the long cherished scheme of a western outlet from the High Ranges. It gives the easiest and most natural outlet for the produce of the High Ranges to the west coast.

The following table gives the important bridges with their locations :—

Communications: Important bridges.

Bridge	Location	Bridge	Location
<i>I. M. C. Road</i>		<i>IV. Trivandrum to Quilon</i>	
1. Vāmanapūṭam	20½ miles	1. Māmam	19 miles.
2. Kilimānūr	24½ "	2. Vāmanapūṭam	22 "
3. Iṭhikkara	34½ "	3. Iṭhikkara	33½ "
4. Yēnādi	53½ "		
5. Aochencōil	65¾ "	<i>V. Quilon to Shencotta</i>	
6. Erappuḷa	75½ "	1. Punalūr (Suspension)	28½ "
7. Varattār	77½ "	2. Kaldoorty	43½ "
8. Manimala	86½ "	<i>VI. Quilon to Alleppey</i>	
9. Cannanparaūr	94½ "	1. Nindakara	5½ "
10. Kōdimatha	97 "	2. Kāyengkulam	84½ "
11. Nāgampādādam	98½ "	3. Kannālipālam	38½ "
12. Nīlimgalam	130½ "	4. Thoṭṭappally (wooden Bridge)	
13. Mūvātupūḷa		<i>VII. Alway to Munnar</i>	
<i>II. Main Southern Road, Trivandrum to Tinnevely via. Aramboly</i>		1. Nēriamangalam	34½ "
1. Killiyār	¾ "	<i>VIII. Thiruvella to Kozhencherry</i>	
2. Karāmana	1¾ "	I. Vallamcolam (Māmalala)	3¼ "
3. Neyyār	13 "	<i>IX. Kottayam to Kunīli</i>	
4. Kuḷiṭhura	23¼ "	1. Vandiperiyār (Periyār)	59½ "
5. Valliyār	33½ "	<i>X. Northern outlet Road</i>	
6. Palayār	42¾ "	1. Chinnār	36¼ "
<i>III. Trivandrum to Shencotta</i>			
1. Karakulam	7¼ "		
2. Killiyār	13¼ "		
3. Chittār	24½ "		
4. Parappār	44½ "		



Nintakara Bridge.

The introduction of railway into Travancore was taken up by the Travancore Government in 1876. After a prolonged correspondence till 1898 the
Railways. Madras Government ordered a resurvey of the Ghat Section and the Government of India placed the services of Theodore Michell, Executive Engineer, at the disposal of the South Indian Railway Company to take charge of the survey and construction of the line. Sanction was received from the Secretary of State for India in 1899 to commence work at once and the Government of India granted an allotment of Rs. 7,00,000 for construction work in the British Section. The Travancore Government also advanced Rs. 17 lakhs as soon as the S. I. R. Company had raised debentures on the guarantee of the Government of India—a guarantee which the State also gave as regards the cost of the line passing through Travancore.

Of the total length of the line 50·33 miles are in British territory and 57·94 in Travancore. By September 1900 the survey work of the whole route was finished and construction begun. Through communication from Quilon to Tinnevely was opened on the 26th November 1904. The original estimate for the line was Rs. 1,01,62,018 for 103·33 miles, but this had increased considerably, the actual amount spent being Rs. 1,57,71,766 for 108·27 miles, Rs. 45,06,129 for the British Section and Rs. 1,12,65,637 for the State Section.

The railway runs over a difficult tract and the work done on the Ghat Section is pronounced to be exceptionally good. There are five tunnels all of which go through very hard granatoid gneiss. The longest of them is 2,800 ft. From Quilon station a sliding has been made to the back-water near the Residency.

The following are the salient facts connected with the agreement between the S. I. R. Company, on the one hand, and the Travancore State and the Government of

India, on the other, for the construction and working of the lines:—

The company was to raise up loans at $2\frac{1}{2}$ per cent. So the Secretary of State for India authorised it to increase the interest to $3\frac{1}{2}$ per cent, the rate which was found absolutely necessary for raising debentures. The total interest on the capital raised was to be divided in proportion to the actual expenditure incurred on the British and the Travancore sections of the line and the sterling figures were to be converted into Indian currency at Rs. 15 per pound, the interest being payable from the State revenue during the construction of the line.

The company had constructed the whole line including the rolling stock at the cost price and had undertaken to work it on completion at the same rate of expenses as obtains on the whole system, the cost of maintenance for two years opening to be debited to the capital. Any surplus profits obtained by working the line on the above conditions would after deducting the share payable to the company be divided between the Government of India and the Travancore State in proportion to the lengths of the sections of the line in their respective territories and any loss that might result would be borne by them in proportion to the capital invested on the construction of their respective sections.

As regards the terms of purchase, the Government of India reserved to itself the option of purchasing the entire line at the end of 21 years, and thereafter at intervals of 10 years on 12 months' notice, the purchase price being 25 times the years' average net earnings not including rebate payments of the 3 years preceding the purchase, with a maximum price of 120 and a minimum price of 100 per cent. of the cost price on a rupee basis. In the event of its being decided to exercise this right, the Government of India would offer to the Travancore State the option of purchasing the section of the line within its own territory, that Government and the Travancore State each bearing a share of the total

purchase price of the whole line proportionate to the capital cost of its own section. Should the State effect this purchase, a choice between the two following courses would be given to it.

(a) It may work its own portion as an independent line or have it worked for it the present by company on its own responsibility and risk; or

(b) the two sections may be worked by the Government of India as a single line, the net earnings thereof being divided in equal shares, and the Government of India (the proprietor of the best paying section of the branch) guaranteeing to the state out of that Government's share of net earnings of the Branch Railway such an amount as will make up the State's share to 3 per cent. upon its outlay on the purchases of its section.

Cochin-Shoranur Railway.—The Cochin-Shoranur Railway passes through certain portions of Travancore. In October 1899 the Travancore Government was requested by the Madras Government to make the necessary arrangements to assume the lands within the State required for the purpose and make them over to the Madras Railway authorities who undertook to construct the railway line on behalf of the Cochin Sirkar. A special officer invested with the powers of a Dewan Peishkar under the Land Acquisition Regulation was at once deputed for the purpose. A declaration of cession of power and jurisdiction of all kinds over the lands so acquired was also executed by His Highness the Mahārāja in the form prescribed by the Government of India and submitted to that Government. The Government of His Highness the Mahārāja also agreed to the usual charges on account of the Police on the railway.

This railway was opened for goods traffic on the 2nd June 1902 and for passenger traffic on the 16th July 1902. The length of the line passing through Travancore territory is only 18 miles. Special arrangements have been made

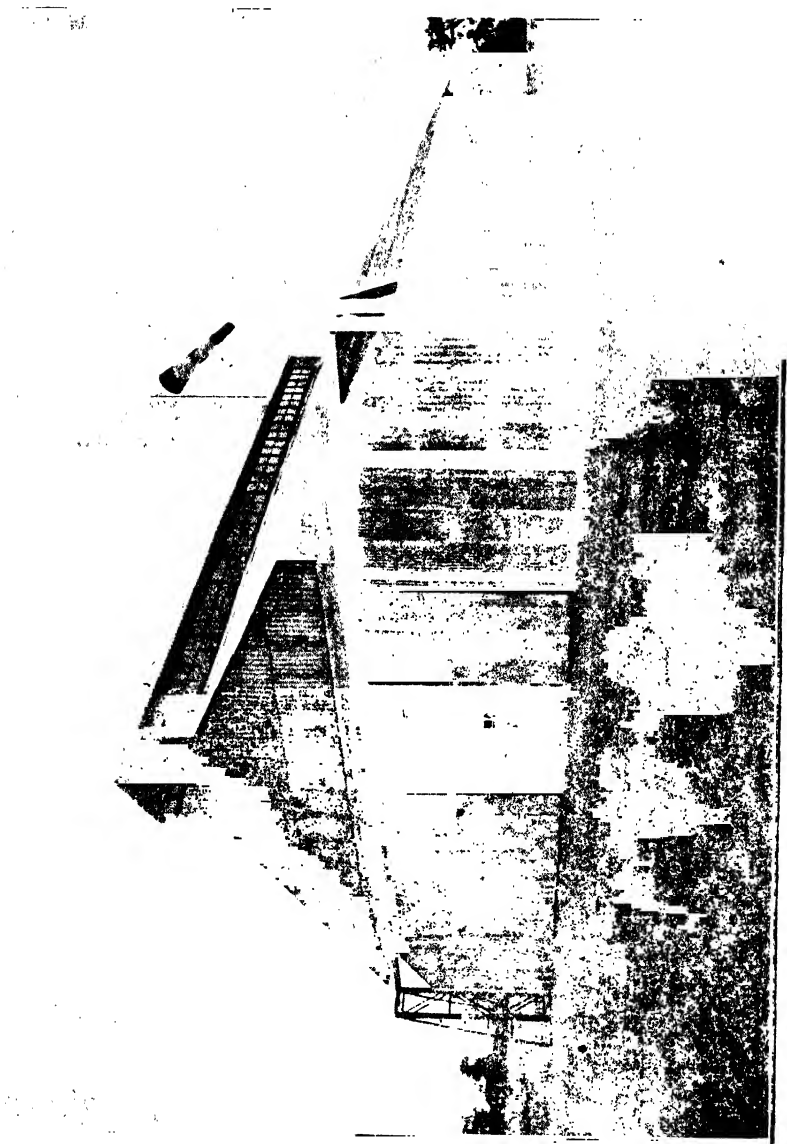
with the approval of the British Government for the protection of the customs revenue of the State by establishing customs houses at Angamāle, Alwaye and Eḍappally, the three stations in Travancore through which the line passes. This railway has now been made broadgauged.

In 1913, the Secretary of State for India sanctioned the extension of the railway from Quilon to Trivandrum. The cost of the extension including rolling stock and compensation for the lands to be acquired were to be met by the State. The extension work was completed in 1917 and the line opened for traffic on January 1, 1918. In 1926 the extension of this line from the Trivandrum beach to Thampānūr in the heart of the town was sanctioned and in 1931 the line was opened for traffic. Travancore is represented on the S. I. R. Advisory Committee.

There is a very large volume of motor traffic in the State. The first motor vehicle was registered towards the close of 1087 M. E. The following statement indicates the condition of motor traffic during the seven years, 1107 to 1113 M. E.

Particulars.	1107	1108	1109	1110	1111	1112	1113
Buses plying for hire.	1,002	945	1,016	1,056	1,039	911	501
Cars plying for hire.	304	247	225	147	134	144	156
Vehicles newly registered.	282	285	438	536	134	486	574
Lorries.	89	96	118	64	50	49	43

Buses and lorries are used for the transport of passengers and goods. Anchal and Postal articles are now sent by buses in many parts of the State. Cycles and conveyances



Aerodrome.

drawn by horses, bullocks and buffaloes are also used for internal traffic.

Very recently a new passenger air service between Trivandrum and Bombay has been opened. The service was inaugurated on the 29th October 1935.

Air transport. There are two halting stations, Goa and Cannore on the way. Arrangements have been made for the aeroplane to have railway connections at Cannore in both the directions. Aerodromes have been constructed in Trivandrum and Quilon.

The Government had for some time past been alive to the fundamental defects of the existing system of transport which was mainly controlled by State Transport.* private agencies and individuals. Owing to cut-throat competition among these agencies, each endeavouring to oust the other and to appropriate the profits to itself, the system had been thoroughly demoralised. There was unnecessary waste of capital by running more buses on the routes than was necessary to meet the requirements of the travelling public. The Government was convinced that transport was a fundamental and supremely national need. In pursuance of this declared policy the Government issued a communique on the subject on the 20th of October 1936, laying out the main principles underlying the scheme and emphasising that "it is the duty as well as the right of Government to take into its own hands the control and regulation of public conveyances along the main trunk road and in other selected localities in the State and to improve and organise water borne traffic."

Shortly after, a committee designated the Transport Re-organisation Committee was constituted and that committee resolved that an expert should be appointed to work out.

* The account has been supplied by E. G. Salter, Superintendent of Transport.

the transport scheme. Accordingly, Mr. E. G. Salter who was the Assistant Operating Superintendent of the London Passenger Transport Board, which is the biggest transport undertaking in the world, was appointed as the Superintendent of Transport and a new department named the State Transport Department was organised. Mr. Salter arrived at Trivandrum on the 20th of September 1937 and assumed charge of his office immediately.

Soon after, sixty Commer Chassis fitted with Perkins Diesel engines were got down from England and these were erected by the mechanical staff of the department under the close supervision and guidance of the Superintendent. An experimental body was designed by the Superintendent with the co-operation of the Superintendent of the Workshops and this served as a model for building bodies for the remaining chassis. It may be mentioned in this connection that the bodies were built by local workmen using local materials excepting glass and sheet iron.

The selection of the operating staff deserves mention in this connection. Drivers were selected exclusively from among those who were working on the Trivandrum-Cape route and were likely to be thrown out of employment owing to the introduction of the scheme. The policy of the department to entertain men with educational qualifications as conductors has helped to solve to a certain extent the problem of educated unemployment in the State, for more than one hundred graduates have been entertained as conductors and inspectors.

The State Motor Service was inaugurated by His Highness the Mahārāja on the 20th February, 1938/19th Kumbham 1113 M. E. when a distinguished gathering of many hundreds of specially invited guests, official and non-official, assembled in the temporary garage building at Thampānūr. The inauguration ceremony consisted in His Highness the Mahārāja, Her Highness the Mahārāṇi and His Highness the Eḷayaṛāja, accompanied by Captain Gōdavarma Rāja

and the Dewan, ceremonially riding in one of the State Transport buses driven by Mr. Salter, the Superintendent, accompanied by thirty three other buses carrying guests along the main road to Kaudiyār Square. Regular service to and from Trivandrum commenced from the morning of the 21st February.

In the very short time during which the service has been in operation, it has shown perceptible signs of an unqualified success. This does not merely consist in the profits that the Government is making out of the concern but also in the matter of better facilities offered to the travelling public. The saloon bodied buses with rear entrance and gangway in the middle, with first class seats upholstered in leather, accommodate 23 persons each in the maximum of comfort. The buses depart and arrive at scheduled timings. A time table detailing the services between various centres and a table of fares over the various sections have been printed and published for the guidance of the public. A parcel service has been introduced in conjunction with the passenger service. By this arrangement people can send goods to the various places on the route through agents appointed by the department, who receive and transmit parcels from consignors and distribute them to the consignees in their localities. This is a new feature in bus service which would prove of very great help to business-men and the public at large. It may be mentioned here that in order to facilitate the working of the parcel service the crew of a bus has been increased to three by the addition of a parcel clerk, and the conductors who were previously working in the line have been mostly absorbed in this capacity.

It is intended shortly to extend the service throughout the State. The question of taking over water transport under state management is also being considered by the department.

CHAPTER XXI

ELECTRIC POWER.

Schemes for the supply of electric power are of recent growth in Travancore. In 1906, the Kappan Dēvan Hills Produce Co., a firm of European planters owning extensive tea estates and several factories in the High Ranges, installed a plant of 200 K. W. capacity for the supply of power to their factories. It was at this time that hydro-electric power was first introduced in Travancore. As the advantages of cheap hydro-electric power came to be realised, the plant was extended until, in its present form, it consists of six generating sets with a total capacity of 1,900 K. W. All the twenty seven tea factories belonging to the company, of which a few are "All-Electric", are working now with power from this source. This power is also utilised for running their ropeway which until recently was the only suitable system of transport for their product in view of the steep gradients and contours of the area in which the estates are situated, which often make road transport very difficult.

In 1918 the attention of the Government was focussed on the question of harnessing some of the important waterfalls of the State. Mr. F. J. Jacob, Chief Engineer to the Government at the time, conducted a preliminary survey of the hydro-electric possibilities of the State and submitted his report in the same year. An extract from that report is given below:—

"There appears to be a very considerable public demand at the present time for all forms of industrial development. The bed rock of all industrial development is, however, cheap and accessible power. As we are situated in Travancore, thousands of miles from oil fields and coal

mines, these sources of power are denied us. It would commercially be impossible to enter into competition with Bengal, for instance, where coal costs Rs. 8 per ton against as much as Rs. 30 per ton delivered at Quilon, and the same remarks apply generally to power generated by oil engines. The only remaining sources of supply are firewood and water power. Wood is commercially unprofitable owing to its low heating power. For the serious industrial development of the west coast the only practical remaining source of supply is therefore hydro-electric. Fortunately we are or should be well situated in this respect owing to heavy rainfall and our proximity to the Western Ghats. The Cochin Government have recognised the necessity and are initiating a scheme by which they expect to develop no less than 7,000 H. P. and Messrs. Tata and Sons are engaged on a huge hydro-electric project somewhere near Belgatm. In considering any hydro-electric project the requirements are either a big fall in association with a small flow of water or a large river discharge and a moderate fall. There must, I believe, be many rivers or streams within the State where one or other of these requirements is to be found. It is my desire to undertake the investigation of all likely or probable sites for water power.

* * * * *

“It will be competent for Government to either develop the source of supply themselves, to use the power for street lighting, etc., or to sell the power to existing mills, factories, or prospective industrial enterprises or to lease out the water power and allow the development to be undertaken by one or more public companies. There are several directions in which industries may be developed when cheap power is available. As a high power line can economically convey electricity for distances up to 200 miles or even further, the various tea factories, tile works, saw mills, etc., would surely find it to their advantage to introduce electrically driven machinery. The failure of the Punalūr Paper Mill

was due to the high cost of bleach, but with the available electric power, bleach can be made from the chemical treatment of salt and lime; and abundant supplies of raw materials are available in the State for both paper manufacture and for paper pulp for export, and the development of paper manufacture on a profitable basis may be foreseen. Another direction in which electrical power may be suitably utilised in Travancore is in the manufacture of coconut products such as margarine, etc., and the extraction of oil from oil seeds and the contingent industry of soap manufacture. Finally there is the extraction of nitrates from the atmosphere whereby manures are cheaply and easily obtained. This form of industry has been largely developed in European countries within the last decade or so. The supply of cheap and good manure is an absolute necessity for an agricultural country like Travancore and with a cheap and generous supply the steady advancement and the agricultural development of the State would be assured for many years to come."

While the report was under consideration, the Government sanctioned in 1927 a scheme for the installation of a thermal station to supply power for lights and fans in Trivandrum, and for this purpose they created a separate Electric Division in the Public Works Department. The works were completed early in 1929. The scheme which was started on a modest scale has made considerable progress during the last ten years. The capital investment of this undertaking is at present over Rs. 9 lakhs. The present capacity of the generating station is 700 K. W. But it will be increased to 1,050 by the installation of a new set of 350 K. W. which is expected shortly. Although the Trivandrum Power Station primarily caters for the lighting load, satisfactory progress has been made during the last few years in finding a use for electric power for industrial purposes. This has resulted in a steady day load of 200 K. W. for the Rubber Factory, Printing Press, oil mills,



Trivandrum Power House.

flour mills, Pumping Plant and Ice Factory. The scheme is on a satisfactory financial footing and pays 5 per cent. return on its investment, besides providing for a substantial contribution towards depreciation and reserve fund. The gross income per annum is about Rs. 2½ lakhs.

Encouraged by the results of the Trivandrum Power House, private agencies came forward to supply power. Licenses were obtained by private individuals for the generation and distribution of power in the towns of Kōṭṭayam and Nāgercoil and the supply began in 1107 M. E. (1931) and 1109 M. E. (1933) respectively.

The supply of power for the town of Quilon was undertaken by the Government early in 1110 M. E. (1934 A. D.) The Power House is equipped with three Mirrlees Diesel Sets of a total capacity of 140 K. W. The length of the overhead lines extended to 26 miles at the end of 1112 M. E. Arrangements are in progress to instal another generating set of 133 K. W. to meet the additional demand for power.

With the inauguration of the Electric Supply in four of the major municipal towns of the State between 1929 and 1932, all of which are worked with Thermal Power, the attention of the Government was focussed early in 1932 towards the investigation of the possibility of providing cheap power for the industrial and agricultural requirements of the State.

Investigations were conducted and details collected for the following schemes.—

1. Valiyāttumukam on the Kōṭhayār river.
2. Kombe kāṇi on the Neyyār river.
3. Kalduruṭṭi }
4. Mīnmuṭṭi } On the Kuḷaṭhūpula river.
5. Ottakkal }
6. Kaki Aṟuvi on the Kakiyār, a tributary of the Pampa.

7. The Pampayār.
8. The Tual Falls on the Kallār river.
9. Paḷlivāsal on the Muthirappuḷa river.
10. Kaṛimbankuṭhu on the Peṛiyār river.
11. Peṛubankuṭhu on the Karaṇḍiyār.
12. Aṛuvikkaṛa on the Kaṛmana river.

A detailed investigation of the Paḷlivāsal Hydro-Electrical Project, which was considered the most economical of all the projects, was sanctioned in the same year. This investigation was completed in May 1933, when the execution of the work was taken up and the present Electricity Department of the State created.

The Paḷlivāsal falls are in the Muthirappuḷa river, a tributary of the Peṛiyār. The total head available is approximately 2,000 feet, which is distributed over three miles of water course. The Mūnnār river contains a perennial supply of water and, even based on the minimum dry weather discharge so far recorded, it is possible to generate 9,000 K. W. (continuous) which would be augmented by another 4,500 K. W. by the construction of a diurnal reservoir which forms part of the present development.

The present programme of construction is for the development of 9,000 K. W. and the ultimate capacity of the project, as now designed, is 22,500 K. W. A Diversion Wier with collapsible shutters is being constructed at Mūnnār and water from the Muthirappuḷa river is to be diverted through an open channel up to a length of about 1,500 ft., and let into a tunnel bored through the Nāgamala Ridge. The tunnel is already excavated to a length of 10,200 ft. and 9 ft. x 8 ft. section. Portions of the ground which are found to be unsatisfactory are being lined with concrete. At the tunnel exit, which is about four miles by road from Mūnnār, water is let down to the Power House by means of two penstocks each of which is 7,447 ft., in length carried on suitable supports and anchored at frequent intervals.



Hydro-electric Works, Pallivasal.

The Power House will contain three Generating Units of 4,500 K. W. each. Power will be generated at 11,000 volts and stepped up to 66,000 for transmission to the plains through double circuit overhead lines carried on steel towers to a total length of 147 miles. There are five main 66 K. V. sub-stations where the voltage will be stepped down from 66,000 to 11,000 for distribution to most of the important towns and rural centres in North and Central Travancore for industrial and agricultural requirements. In addition to the above 147 miles of 66 K. V. lines, there are 26 miles of 33 K. V. lines and 133 miles of 11 K. V. lines covering the distribution net work that is taken up in the first stage of the project.

With the inauguration of the scheme, it is expected that one of the main handicaps for the industrial development of the State, viz., the absence of cheap power, will be overcome and the State with its excellent supply of raw materials will be able to utilise them to their fullest extent. The various textile, coir and oil mills at Alleppey and Quilon, the tile factories and the ilmenite mineral companies, which now make use of their isolated power plants where the cost of generation must necessarily be high, are expected to take advantage of the hydro-electric power and effect considerable economies in their operation.

The Pallivāsal Project has attracted considerable attention from the leading industrialists in India like Sir Victor Sassoon who has already started the foundation of his business in Travancore with the inauguration of a Bleach and Finishing Mill at Alwaye. The State Forest Department has investigated the possibility of using the local reeds (*Ochlandia Travancorica*) for the manufacture of pulp and paper and has estimated that there is considerable scope of running a paper mill with an annual output of 6,000 tons. The rich deposit of China clay available near Quilon is also being exploited. The question of using electric power for running trolley buses on some of the

major trunk roads of the State, where the density of the present traffic justifies such a scheme, is under consideration.

There are about 50,000 acres of land round about Alleppey which require pumping every year for cultivation. It is expected that with the supply of hydro-electric power in these areas, the cost of pumping will be appreciably reduced. It is also the intention of the Government to extend the net-work to all the rural areas in North and Central Travancore where lift irrigation using electrical power appears to be a definite economic proposition.

In view of the fact that the capital expenditure on the project is comparatively low, it should be possible to supply power at a very attractive tariff for the various purposes for which it is expected to be utilised. The question of fixing the tariff is now receiving the careful attention of the Government and it is expected that the rates under this hydro-electric project will be similar to the rates which the Madras Government has found it possible to offer under the Pykara Project.

It is anticipated that from the commencement of the supply, a load of 5,000 K. W. is expected to be connected up, which represents the existing power consumers who are expected to change over to hydro-electric power when it is inaugurated. There are very clear indications to show that the power available under the present development will be fully utilised within three years from the commencement of operation when the scheme will be self-supporting.

It is the intention of the Government not only to enable the major industries in the State to take advantage of this cheap power, but also to give a stimulus to the expansion of cottage industries and to agriculture by making the benefits of it available in all the important rural centres.

CHAPTER XXII

INDUSTRIES.

The total working population (earners and working dependants) returned under industries in the Census of 1931 was 351,076. This represents 15·1 per cent. of the population. The proportion of the population supported by industries is higher in Travancore than in the whole of India, where the percentage is only ten. The industrial population has been increasing steadily during the last three decades. In 1911 the number of persons employed in the various industries was only 288,947. In 1921 the number increased to 328,092 and in 1931 it reached the present figure. The textiles, wood, metals, ceramics, chemicals, food, dress and building are the subjects of the important industries in the State. The number and the percentage of the population (as recorded in 1931) engaged in each of these industries are given below :—

Industry.	Number in 1931.	Percentage	Variation since 1921. Per cent.
<i>Industries.</i>	<i>351,076</i>	<i>100·0</i>	<i>7·0</i>
Textiles.	130,590	37·0	8·6
Wood.	55,253	15·7	15·3
Metals.	13,493	3·8	4·2
Ceramics.	9,302	2·6	7·4
Chemicals.	11,610	3·3	13·4
Food.	56,167	16·0	19·4
Dress.	42,156	12·0	4·8
Building.	17,024	4·8	344·6
Miscellaneous.	13,737	3·9	9·6

The industries of Travancore can be classified under two sub-divisions, viz.,

1. Factory industries, and
2. Cottage industries.

FACTORY INDUSTRIES

Factory industries are only gradually coming into prominence. Their number is increasing every year as would be evidenced by the steady rise in the number of factories in the annual statistics. At present, there are 159 factories. They are distributed as under :—

Dēvikulam.	78
Kōṭṭayam.	13
Quilon.	66
Trivandrum.	2

Of these seventy seven factories in the Dēvikulam taluk are engaged in the manufacture of tea and one in the curing of cardamoms. The remaining eighty one factories in the other divisions are engaged in the manufacture of titles, coir yarn, coir mattings, tea, rubber, paper, steel goods, sugar, matches, extraction of coconut oil, mining, preparation of cashew nut kernel, spinning and weaving. The factories are worked either by oil, gas or steam engine, manual labour or electricity, or by a combination of one or more of the above mentioned powers. Approximately, 19,000 hands are employed in all the factories together. These include 3,300 women and 2,900 children.

The more important of the factory industries are the expression of coconut oil and the manufacture of coir yarn, mats, mattings, etc. Alleppey is the chief centre of the coconut industry. The expression of the coconut oil is one of the early industries of the State.

Coconut oil is pre-eminently the most valuable oil in Travancore. Alleppey, Sherthala, Quilon and Kōṭṭar are the chief producing centres. The steam driven Rotary Ghanis

are used in the first three centres, while the oil is expressed in country chakkus in Kōṭṭār and adjoining villages. The quality of the oil depends on the quality of the copra used and hence great care is bestowed on the preparation of copra for the mills.

Copra is prepared by drying the kernel. This is done either by exposing it to the sun or by smoking it or by blowing hot air over it. Sundrying is the usual practice as it produces the best oil. Copra is sorted into two kinds, the white and the dark. The finest white copra is consumed in British India, while the next best variety, known as "First Grade White", is exported to foreign countries. Copra ordinarily contains 60 to 65 per cent. of oil.

There are three processes by which oil can be extracted from copra. These are the cold dry process, the hot wet process, and the solvent process. The first is invariably followed here to the exclusion of the other two. This gives oil of the finest quality, but the yield, as a rule, is poor. This defect is countered by the fact that the oil produced by the adoption of this method keeps longer without becoming rancid and the oil cake (punnac) left over, by reason of its oil content and agreeable flavour, fetches a good price as cattle food.

The ordinary country ghani and the Rotary Ghani are used for the extraction of the coconut oil. The country ghani consists of a granite mortar and a pestle of hard wood. Cattle power negotiates these through a horizontal beam. This process of expression is slow and tedious. The Rotary Ghani is driven by steam power. This is cheaper and at the same time more efficient.

There are three grades of coconut oil. These are:—

- (i) Office White,
- (ii) Bazaar White; and
- (iii) Dark (or sediment).

"Office White Oil" is semi-transparent and possesses a peculiar nutty flavour. It is obtained from the best varieties

of copra, usually the white. "Bazaar White Oil" is obtained from dark brown copra. The colour of the copra is due to the treatment it receives during the process of splitting and drying. The dark oil is recovered from the sediment which is found in the casks after the clear oil has been drawn off.

The coconut oil has a yellow colour, a peculiar odour and a mild, bland taste. In hot climate the oil remains a fluid, but in cold climate it becomes solid with a pure white colour. Its melting point varies from 20°C. to 30°C. The cold pressed oil melts at 20°C. The fused, thin, transparent yellowish oil congeals at 18° C. to 20°C. The oil is readily saponified at a low temperature. The soap is quite hard and capable of absorbing much water. It consists chiefly of the glyceride of lauric acid and partly of the glycerides of myristic, stearic and palmitic acids. In India coconut oil is used largely for culinary and toilet purposes. Pure coconut oil is a good substitute for butter and is extensively employed in the manufacture of margarine and coconut butter. It is also one of the important oils used in the manufacture of soap and candles. It produces a white, hard soap which is more easily soluble in hard or even brackish water than the soap made from any other oil.

The residue that is left behind after the extraction of oil is a rich and valuable food to cattle, sheep, and poultry.

Punnac. The shell that surrounds the kernel is very

hard and is used chiefly as fuel or is converted into charcoal. It is also made into bowls, spoons and other utensils. It is an excellent material for carving, and fancy articles are carved out of it. From the thick outer covering of the coconut, known as the "husk", a valuable fibre is extracted.

The husk or the outer covering of the coconut provides the raw material for one of the biggest industries of

the State, namely, coir yarn and coir mats and matting.

Coir yarn industry. The opening of coir factories by local industrialists, of which there is quite a large number to-day, dates back only to a couple of decades. Although there had been spasmodic enterprises now and then, the industry did not thrive as the early attempts were wanting in steadiness. It was also difficult to find outlets for the manufactured products. But now the products of Travancore compete successfully both in Indian and foreign markets. Some ten years back there was a boom in this trade. As a result of this several individuals and joint stock companies began to run coir factories. But before long a slump occurred in the trade. There was also unhealthy competition, so much so, several of these factories had to be closed down.

Formerly coir products could be produced only in well equipped factories. Now the industry has become so common and its processes so familiar that it has really transformed itself into a cottage industry. The matting industry, however, is still a factory industry, as the process of the manufacture of matting is somewhat complicated and makes expert handling necessary.

According to the Census of 1931, the total number of persons engaged in the coir yarn industry either as full time or as part time workers was 126,427. This figure registered an increase of 23 per cent. over the figures of the 1921 Census. More than two-thirds of the workers mentioned above were females.

The preparation of the coconut fibre and the spinning of coir yarn are carried on mainly as cottage industries. Very often men, women and grown up children in a household are engaged in these works during their leisure hours; women who prefer to work indoors find this occupation quite congenial to them and consequently there are more women than men workers. The weaving of mats and matting out

of the coir yarn prepared by cottage workers is done largely in factories, where more men than women are engaged.

The importance of the coir industry may be gauged from the fact that out of 351,076 industrial workers as many as 126,427 or 36 per cent. are employed in this industry alone and that the value of the products of the coir yarn industry contributes substantially to the value of the total export trade of the State annually.

The industry begins with husking. Immediately after plucking the coconuts, the husking takes place and the coconuts are peeled into three or four pieces. For this purpose a sharp pointed spike of metal or pointed piece of hard wood is fixed firmly in the ground and the husks are separated by striking the nut against the sharp edge. The husks are then brought to the soaking place where they are steeped in places alongside the backwaters or near the sea-beach where the mud and water conditions are favourable for 'retting'. They remain buried for a few months until they soften sufficiently to be beaten out so as to separate the fibre from the pith and the skin. The fibre is the basis of all coir yarns and coco mats and matting. There are two ways of spinning—spinning by hand and spinning by wheel. Hand spinning is largely carried on in Vaikom and its suburbs. The yarn produced near the backwaters of the Vēmpaṇāḍ Lake is called Vaikom yarn, while that produced in places near the coast is called the Beach Yarn. The spinning on the wheel is mostly practised in South Travancore. Two frames, one with a stationary wheel and two spindles and the other with a moving wheel and one spindle, are required for this purpose. Each spinner carries a bundle of fibre and the fibre strand to the spindle. This done, he adjusts the thickness of the yarn and walks back till he reaches the other frame or the required length. During this process the stationary wheel is revolved to give the necessary twist. When the strands have reached the required length, which is generally about 59 or 60 feet, the

ends are put together and fixed in the single spindle on the moveable wheel. A triangular block of wood grooved on the sides is introduced between the strands and this helps to regulate the counter twist, prevents entanglements and binds the two stands very close. When the triangular block of wood is taken along the spindles, the turning of the wheels is done fast. The yarn thus twisted is made into hanks and sold.

Coir fibre in its natural state is utilised for stuffing purposes, for upholstery, mattresses, etc. For some of these purposes it is occasionally dyed. In its natural and dyed conditions it is made into fancy door mats of varying patterns. The greater quantity produced is utilised for the spinning of coir yarn.

Coir yarn is put on the market under different denominations. Usually the types distinguish themselves by the name of the locality in which they are produced. They vary slightly according to local conditions. The methods of preparation and spinning are described below:—

Ālapāt. In this district the husks are buried for seven to eight months during which time constant running water passes over them. This water is saltish and the best fibre is obtained when the proportion of fresh water to salt water is as two to one. In some parts the proportion is nearly equal but that does not give so good a colour to the fibre. Ālapāt Yarn is hand-spun, of even colour and regular twist, and is usually considered to be the best. It is divided into three grades according to thinness and colour; the grades are supplied in approximately even proportion at an average price for the whole.

Anjengo. The best real Anjengo Yarn is made from husks which are carefully soaked for about twelve months in lots basketed together which float about in practically fresh running water. Cheaper grades are soaked for a shorter period (about ten months), buried in mud where suitable

supplies of fresh running water are available. For Imitation Anjengo, such as Mangāḍam, the husks are buried in deep holes for four to six months. The water here is brackish. Anjengo Yarn is spun and twisted on wheels, which gives a harder twist than in the case of the Ālapāt and other hand-made yarns. Special and superior Anjengo Yarn is usually of fine, clear, good colour and of regular even twist.

Ashṭamud̥y.—The husks are buried for five to seven months in mud and sand where brackish water regularly flows. The fibre is spun on wheels but somewhat less spun than for the Anjengo type of yarn. Ashṭamud̥y Yarn is also known as “Curva” and is sometimes described as ‘Imitation Ālapāt’.

Aratoray (Ārāṭṭupul̥a).—The husks are soaked in mud for four to six months in lake water. These places are all important centres for the manufacture of coir yarn. The various grades of the different descriptions are woven locally into coco matting for which they are very suitable.

Vaikom or Fine Weaving Yarn.—This is a softer hand-spun yarn produced in North Travancore. The husks are soaked for six to ten months. The yarn is used for matting, but more particularly for the better grades of brush door mats.

Beach or Common Weaving Yarn.—This is softer and hand-spun and is produced, as its name implies, along the coast line. The husks are soaked in tanks for two to five months. It is chiefly used for making the usual grades of door mats and cheap matting. Imitations of the more important yarns, particularly Anjengo, are made in some districts and are known by the name of the place where they are made or as ordinary or Imitation Anjengo.

Coir yarn of all qualities is further made into coir ropes of several grades and it finds many local uses for which cordage is required. Ships’ fenders, shade screens, filter and press bags and nets are also made, but the largest demand is for the manufacture of door mats and coco mattings.

The manufacture of mats and matting was first introduced some seventyfive years ago and Travancore must thank the late Mr. James Darragh, the Mats and matting. founder of the firm of Messrs. Darragh Smail & Co., Ltd., of Alleppey, London and New York, for one of its now largest industries. This firm still has the largest organised factory in the State. A curious fact dating back to the inception of mat making in this district is that every mat maker in Travancore is left-handed, which may be attributed to the fact that Mr. Collins, Mr. Darragh's first factory manager, was left-handed, and so this curious trait has been handed down from generation to generation right down to the present day.

The manufacture of ordinary door mats and coco matting was originally carried on by a few European firms only. As labour became experienced and available, Indian manufacturers also entered into the business. During recent years many small weavers have taken it up with a few looms each, and the weaving of door mats bids fair to become a cottage industry. The weaving is all done by hand labour, generally upon the most primitive-looking looms which, however, are quite effective for their purpose. Door mats are for the most part made in looms usually with beach or Vaikom spun coir yarn. The yarn for the pile is woven into the mat by winding the required number of strands around a grooved rod of the necessary height across the mat; this is cut along the groove at the top of the rod, which thereby forms a pile and is held in place by throws of the weft across the warp. Qualities vary according to the description of the yarn used, brightness of colour, good weight, weaving and finish.

Fibre mats: - As already stated, mats of plain and various fancy designs are made direct from the fibre (before it is spun into yarn). In such mats the "takes" of fibre are all inserted upon the warping by hand and in fancy designs. Some pattern with which the weaver is provided

or which is known to him is followed. The greater cost of slower weaving makes fibre mats more expensive than the ordinary brush mats made from the spun yarn, but high prices are obtained on account of their more attractive appearance.

Chain or Sinnet mats:--These are made with plaited coir yarn, the links and rows being stitched together throughout.

Wool-bordered mats:--These are made in the same manner as fibre mats, but the wool has to be specially imported.

The above mentioned mats are the principal varieties manufactured in the factories of the State with slight variations as to warping, pile, etc. In addition to the actual weavers a large number of people obtain a livelihood from the bye-industries, such as sorting machine, sorting, packing, shipping, etc.

Coco or Coir matting is made in many qualities, according to the description of coir yarn and thickness. All standard widths up to six feet are made and a few manufacturers have looms capable of greater widths. Matting rolls are usually made of fifty yards length. All varieties of yarn, from the cheapest beach yarn to the high grade Anjengo and Ālapāt yarns, are used in making plain matting of all descriptions. Borders and stripes of any ordinary colouring present no difficulty and really fine designs and good patterns are made by the more expert weavers.

Coir Carpets are made in a variety of fancy designs. In these the weft forms the surface of the pattern. They require more time to make and are consequently more expensive than ordinary matting.

Coir machine belting, which is woven to a certain extent at a comparatively cheap cost, finds a fair amount of local demand and satisfactory use.

The dyeing for fancy mats and matting is practically all done with aniline dyes. It cannot be said that coir dyes satisfactorily or as well as other textiles; nevertheless, an

increasing demand seems to exist for mats and matting of coloured designs.

Besides coconuts, oil is expressed from Laurel, Mara-
vetty, Iluppa, Gingelly, Ōdal, Pine, Ānjili, Karinjōṭṭa,
Kāṭṭāvaṇakku, Margosa and fish. All the

Oil industry. oils except that from fish are used mostly
as illuminants. As commercial commodities their impor-
tance is almost nil. The oil expression process is mainly
done through the country chakkus.

The fish oil industry also is not being developed satisfactorily, though there is ample scope for the production of a large quantity of fish oil in the State. Several varieties of fish, rich in fat content, are caught, but their oil is not extracted. The chief varieties that yield oil are sardines, sharks, klothi (file fish) and skates. Oil is not taken from all kinds of fish, for some are wholesome articles of food and as such are not available for the extraction of oil, while others are discarded in favour of less costly and relatively more oil yielding kinds. There are some like klothi and shark the livers of which contain nearly all the fat so that it can be separated without damaging the fish, while some others, the principal of which is the sardine, contain the fat in the body thus necessitating treatment of the whole fish for obtaining the oil. In the latter case, after extraction of the oil, the residue is useful only as manure.

The chief drawback of the fish oil industry is that the fish cannot be caught in quantity during regular seasons. Thus the industries connected with fish lack one of the first elements of success in commercial or industrial undertakings, namely, a steady, dependable and regular supply of raw material. During certain seasons shoals of them appear, the demand is more than satisfied and the surplus wasted. At other times, the supply is not enough even for consumption. Industrialists, therefore, are reluctant to

sink any large amount of capital for the extraction of oil or the manufacture of fish guano.

Tile manufacture is of comparatively recent introduction in Travancore. But it has made rapid progress and continued to do so till the trade depression set in. The manufacture of pressed bricks and tiles was at first started by Europeans, but now a great many Indians also have taken it up. Quilon with the natural advantage of its proximity to a source of fine clay maintains its position as the centre of tile manufacture. The tiles produced here are so good that after serving the large local demands large quantities are exported to British India, Ceylon and Africa. Though clay fit for the manufacture of tiles is found in almost every part of the State, the varieties differ in composition so that some which exhibit a superficial softening at a low temperature are more suitable than others. This superficial softening renders the tiles a little less impervious. In places where the clay is not so easily softened special kilns capable of producing higher temperatures have been constructed. There are in all twelve factories in the State employing 2,179 hands.

“Kaolin and China clay of a quality practically unparalleled anywhere in the east, even including China, exist in an abundant measure in Travancore. Ceramic industry. Clay is one of the great assets of this country and it is hoped that the supply of clays for the textile growth all over India will be one of the features of Travancore very shortly”.*

Clays of various kinds are of frequent occurrence. Red burning clays suitable for the manufacture of bricks and tiles are found on the banks of all the rivers and they

* Sir C. P. Rāmaswāmy Aiyar's Speech at Alwaye while laying the cornerstone of the Bleaching Mills on 5-10-1936.

sustain a large number of brick and tile factories. Earthenware vessels form an important item in the domestic economy of the State. In all households, from the richest to the poorest, earthenware vessels of local manufacture are used as cooking utensils or containers for liquids. The pottery required for these domestic purposes is usually made of red burning clay found among the recent sediments on the banks of rivers. It is made by a caste of people called Kuśavar, and the industry has been in existence in the country from time immemorial. Even now the methods employed by these Kuśavar are of the most primitive kind. The pottery made by them is unglazed. When fresh it is somewhat porous, but becomes impervious to water and other liquids by use. Experiments in glazing earthenware were made with success in the Industrial School of Arts, Trivandrum, many years ago. But glazing has not yet become an industry. China clay is found chiefly as a bed in the geological formation known as the Varkalai Beds in Indian Geology. This formation covers an area of about 500 square miles and the China clay bed is about five feet in thickness. The depth at which the clay is found varies according to the configuration of the country, but it is seldom more than fifty feet. The clay is sometimes tinged pink or yellow with iron, but pure white samples are very common. China clay is also found among the crystalline rocks of the country, where it is formed by the decomposition of granite *in situ*, as in Cornwall. But the occurrence in this mode is neither as extensive nor as uniform as the occurrence in the sedimentary formation.

Stoneware jars are much valued in the country. These are required for various domestic purposes. The jars vary in capacity from a few ounces to 500 gallons or more. The demand for these jars was so great in the past that it is said that colonies of Chinese potters settled down in Travancore for manufacturing them on the spot. Tradition says that the jars which they made with the materials

available in the country were so durable they thought that if they continued to make stoneware of such excellent quality the demand would soon cease, as replacements of broken jars would become unnecessary, and that they therefore quitted the country for good.

No attempt has been made to manufacture stoneware in the country ever since the days of these traditional Chinese potters. Very recently the Department of Industries directed its attention to the problem of utilising the deposits of China clay and other refractory clays existing in the country. Experiments in this direction have shown that a granulite of granitic composition which occurs in abundance side by side with the clays can, like the Cornish stone, be successfully used as a flux in the manufacture of stoneware. The granulite contains a rather high percentage of garnets and other iron-bearing minerals, which impart a colour to the articles. The raw materials required for stoneware making are found in large quantities and their supply is practically inexhaustible. The stoneware articles experimentally manufactured in the School of Arts, Trivandrum, are covered with a white leadless zircon glaze. Experiments are also being made in the manufacture of porcelain with the clays and felspars available in the country.

The question of starting the ceramic industry began to engage the serious attention of the Government from 1108. In that year the Director of Industries visited the Ceramic Department of the Benares Hindu University to discuss the possibility of starting the industry. Some research work with the China clay available in Travancore had already been done there as a result of which it was found that Travancore China clay could be used for the manufacture of high class porcelain articles and for sizing cloth, paper, rubber, etc. The Government have sanctioned the opening of a combined Porcelain and China Clay Refining Factory. This is located at a place called Kunḍara, some fifty miles

from the capital. China clay of excellent quality occurs in this region. Stoneware, mainly in the form of glazed pipes, to be used as sewers is in great demand on account of the drainage schemes that are being taken up by the towns both in and outside the State. The production of good quality jars with acid resisting glazes will meet the requirements of an already existing market. Hydro-electric schemes in the State as well as the surrounding districts of British India will consume a great deal of electrical goods. The very cheap means of water transport both by sea and by the backwaters, coupled with easily adaptable, cheap intelligent labour, are additional advantages that should make this industry prosper.

The State's resources of sugar are large and varied. Still, but for one attempt, very little serious endeavour has

been made in the manufacture of refined
Sugar. sugar. From the palmyra palm (*Barassus flabellifer*) which grows abundantly in South Travancore a sweet juice is extracted from the spathes and jaggery is prepared from it. This jaggery is consumed with great avidity and relish by the people. Though in appearance this crude jaggery is not exactly inviting, it contains a fair proportion of valuable albuminous and mineral materials.

Another palm which can be regarded as a second source of sugar is what is commonly known as the sago palm (*Caryota urens*) from which also, after suitable treatment of the flower bunch and stalk, a juice very rich in sucrose can be made to exude. Sugarcane is cultivated in about 9,996 acres in Central Travancore. In this instance also, the juice is converted into a crude gur. There is just one factory in which palmyra jaggery is converted into white crystalline sugar. The refining is done by the use of activated carbon. The product turned out by the factory is of excellent quality and it readily finds a market. This factory employs 211 hands, The Government had a direct interest in this concern.

This move on the part of the Government was made for the purpose of giving the investors, who were not over-anxious to launch this enterprise, a sense of security and a feeling that the small shareholder would not be left to the mercy of the unscrupulous speculator and company promoter. State assistance, however, did not have encouraging results and the Government have therefore transferred their rights to a private concern.

Rubber passes from its agricultural stage to its industrial stage from its fifth year. It will then be necessary

Rubber. to erect a coagulating shed for the reception and treatment of the latex. In this

building the latex brought in by the tappers is first of all freed of sand, bark and other impurities by straining and is then bulked and standardised to a definite dry rubber content. The coagulation of the latex is effected by means of acetic acid which in the case of crepe rubber is added directly to the bulked latex. Should it be desired to make what is known as sheet rubber, the latex, after being bulked and diluted, is poured into shallow pans for coagulation. The subsequent treatment of the coagulated sheet rubber is simple.

The coagulum is first pressed by hand in order to remove some of the water and at the same time to get the bulky mass of rubber into the condition and shape required for milling. The sheets are then rolled two or three times between even-gearred, smooth rollers, a treatment which gives them a smooth even surface and expresses all but about 20 per cent. of the remaining water. A final run through a mill, this time between marking rollers, impresses the sheets with a pattern and, as a rule, with the trade mark of the estate. The marking which, however, is not an essential part of the treatment, being only done to give the sheet a more attractive appearance for the market, completes the mechanical treatment of the sheet. The sheets are next

washed in running water for a few hours and afterwards hung up for a while. When they have ceased to drip, the sheets are ready to be cured. This is done by placing them on rocks in specially constructed houses into which smoke and heat from basement or external wood fires are admitted. A temperature of 115° to 120° F. is maintained in the (curing) smoke house. The curing process takes ten to fifteen days, by which time the white coagulam should have turned into a dark amber thoroughly dry. The sheets are by now already strong and resilient and are ready to be placed on the market for sale.

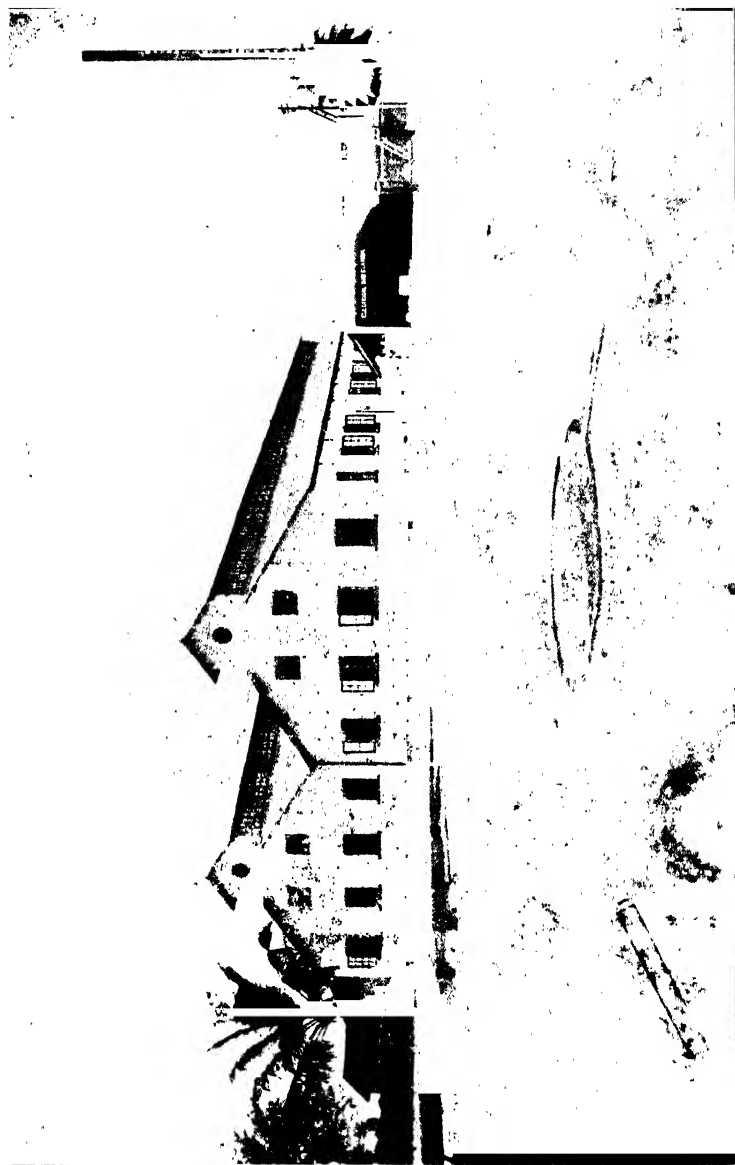
The raw rubber, as placed on the market by plantations, falls roughly into three types. So far, we have described the mode of preparation of one type only, viz., smoked sheet, the reason being that smoked sheet requires the minimum of machinery in its preparation. Smoked sheet can be cheaply made and it is the form of rubber best suited to small holdings on which it may not be profitable to instal power machinery.

Another type of rubber prepared is that known as "First Latex Crepe". The method of coagulation for "First Latex Crepe" is the same as that employed in making the sheet except that, as previously mentioned, instead of pouring the latex into shallow pans, it is coagulated in bulk in large tubs. When the latex in these tubs is sufficiently coagulated, it is passed through a series of power macerating machines. A macerator consists essentially of two uneven-gearred corrugated rollers which grind and chew the fragments of rubber, finally uniting them into long strips of rubber about a foot wide; after this rough macerating treatment strips of rubber are passed between the rollers of another uneven-gearred machine, the rollers this time being smooth. It emerges from these machines after one or two millings in long, thin strips very much like lace. This lace is cut into lengths and either air-dried in well-ventilated drying houses or put into patent driers and quickly and

thoroughly dried by means of hot air currents or in other ways. The lace crepe may be marketed as such or milled after still more artificial drying and sold as "Blanket Crepe".

About 20 per cent. of the output of a rubber estate consists mostly of lower grade "Scrap Rubber", which is made up of rubber which has naturally coagulated on the tapping cuts or has been split on the bark of the trees or on the ground. Under "Scrap Rubber" is also included the rubber which is found adhering to the collecting cups and buckets. Scrap Rubber is usually full of impurities which have to be washed away before the rubber can be put on the market. For cleaning and working up this grade, most estates use powerful scrap-washing machines. These wash the impurities away and chew up the rubber into big sausage-like rolls. The rolls thus obtained are treated in the same fashion as "First Latex Crepe" and are transformed into lengths of crepe in varying shades of brown, designated for marketing "scrap crepe".

The Travancore rubber plantation industry has received substantial aid from the Scientific Department of the United Planters' Association in South India. The Government of Travancore has done its very best to encourage the industry. It has contributed a good sum towards the expenses of the researches conducted under the auspices of the above Association and when a Mycologist was appointed to study the local rubber diseases, the Government generously gave the land on which the Mycologist's bungalow and laboratory were to be built. These scientific aids coupled with the natural facilities for cultivation led to rapid progress in the growth of the rubber industry in Travancore. But unfortunately the production far exceeded the demand and unexpectedly the rubber slump occurred. With a view to adjust the supply to the demand and maintain a fair and equitable price level, an agreement was entered into in 1934 by the various rubber producing countries of the world to restrict the production and export



Rubber Factory.

of rubber for a period of five years. Participation in this agreement made the export of the whole quantity of rubber produced in the State impossible and it was therefore necessary to find out some method to utilise the excess production. The Government, however, came to the rescue. They started a Rubber Factory at Trivandrum equipped with up-to-date machinery for the manufacture of motor and cycle tubes, cycle and cart tyres, hoses, water-proof clothing, toys and other articles. This Rubber Factory was the first of its kind in India and by starting this pioneer industry the Government expected to show to the public the possibilities and prospects of the rubber industry. His Highness the Mahārāja was pleased to declare the State Rubber Factory open on the 1st Chingam 1111 M. E. and with an illuminating and spirited address blessed it with success and increased usefulness. The factory worked under government auspices for twenty months, when it was transferred to private individuals. The original expectations have borne fruit. The State initiative has encouraged new enterprises. Rubber factories are being opened by private individuals. The Government has also helped the rubber industry by falling in with the International Rubber Restriction Scheme and passing the Rubber Control Regulation II of 1112 to provide for the control of the extension of the cultivation of rubber.

In point of importance, tea ranks next to rubber among plantation industries. The tea factory equipped with necessary machinery is erected in a central position on the tea estate. A tea factory, like any other building of this sort, is severely practical and does not aspire to any architectural beauties; in fact the large corrugated iron buildings which represent a tea factory are often a blot on an otherwise pleasing landscape.

In no branch of the Indian tea industry has greater progress been made than in the process of manufacture of

the tea of commerce from the green leaf plucked from the bushes. As the art of tea cultivation came to India from China, it is only natural that the Chinese methods were at first adopted, but before long the methods were improved and machinery began to be used. Unlike among the Chinese, the rolling of tea and the drying of the rolled leaf are done by the use of machines in Travancore.

There are two distinctly different methods of making tea, according to whether black or green tea is required, but, as the manufacture in Travancore, and indeed in all Indian tea districts, is almost entirely confined to black tea, the latter process alone is described here. A *sine qua non* of making good tea, either black or green, is to get the freshly-plucked leaf into the factory as quickly as possible, and this is not always an easy matter to arrange, especially on a big estate on fairly steep land. A favourite method is to erect wire shoots which consist of a long wire (some are over a mile long) stretched from the top of the hills down to the factory, which is generally placed in some low central position. Small gravity runners are placed on the wire rope and the bags of leaf hooked to these run down the wire at a tremendous speed, various ingenious methods being employed to check the pace at the end to prevent the leaf being bruised. In other cases, where the conformation of land will not allow shoots being used, the leaf is carried down to the nearest cart road on coolies' heads, whence it is transported to the factory by means of some conveyance. If there is no cart road, the leaf goes the whole way to the factory on coolies' heads.

On arrival at the factory, the leaf is thinly and evenly spread on tiers of tightly stretched material, sometimes wire mesh of a small size, but more often jute hessian cloth, and there it is allowed to lie for eighteen to thirty hours according to the weather. This process is called "withering", the object being to evaporate a certain amount of the moisture out of the leaf and so render it flaccid, in which state it will

take on a good twist in the rollers. In wet weather it is often necessary to resort to artificial means to accomplish this, a supply of hot air in conjunction with mechanical fans being used; but the artificially withered leaf seldom, if ever, turns out to be as good as the tea obtained from natural wither. Properly withered leaf will have lost from 40 to 50 per cent. of its weight from the fresh green state in which it came into the factory. This withering process is carried on in the upper floors of the factory, of which there may be one, two or three, according to the style of building, the ground floor always being reserved as a machinery room, where all the remaining processes of manufacture are carried out. Even with three lofts closely packed with racks, there will be seldom sufficient space for spreading all the leaves when the estate is in full bearing, and resort is often had to separate withering houses which are erected at a convenient distance from the factory.

Directly the leaf is properly withered, it is removed from the racks and taken to the rollers. These are large and circular machines which consist of a flat table with small wooden or brass battens across it and a round bottomless box, smaller than the table, held just clear of it by three cranks. This box is filled with the withered leaf and the machine set in motion, when the box moves with a circular action over the table, really forming the bottom of the box, which, with the help of the battens, imparts a twist to the leaf. The leaf is left in these machines which run at fortythree to fiftyfive revolutions per minute for about half an hour, when it is taken out and put over a mechanical sieve which sifts out the small broken leaves. This is taken to the fermenting room and the remainder which went over the sieve is put back into the roller for a further period. This rolling process serves not only to put a twist on the leaf but also breaks the leaf cells, thus freeing the juices which give the characteristic flavour and colour to the infusion made with boiling water for drinking purposes. To ensure the thorough breaking

of the leaf cells, most modern tea rollers are fitted with a movable cap taking the place of the top of the box, which can be screwed down with great pressure whilst the roller is in action, thus squeezing the leaf on to the table. The leaf is rolled in this way three, and sometimes four, times when it is put into the fermenting room. Here it is spread about three inches thick and kept as cool as possible. A moist atmosphere helps the fermentation and arrangements are generally made to ensure this. The time the tea takes to reach the proper stage of fermentation varies with the condition of the leaf and the temperature of the fermenting room, but a good tea-maker can judge by the appearance and smell of the leaf just when it has been carried far enough. At the time the leaf goes into the rollers it has a bright green colour; it begins to change owing to the juice starting to ferment directly they are exposed to the air, and when the fermentation is complete, the leaf assumes the bright copper colour of the infused tea.

The fermented leaf is then taken to the driers. These are large machines with ingenious hinges and perforated trays running slowly through them, on which a blast of hot air continually plays. The leaf which is spread on them is turned over at intervals. The best and most modern driers are entirely automatic in action, and two men, one feeding the fermented leaf into the machine and the other stoking the furnace which supplies the hot air blast, can work the largest of them and can turn out as much as five hundred pounds of tea every hour. A large factory turning out over a million pounds of tea in a year will have several of these huge machines working most of the day and, in busy times, during the night too. The temperature at which tea is dried varies from 200 to 230 degrees.

As the tea comes out of the driers, it is taken to the sifting room, where large mechanical sifters sort it out into the various grades in which it is put on the market; these are, in their order of merit, Broken Orange Pekoe, Broken

Pekoe, Orange Pekoe, Fekoz, Pekoe Souchong, Fannings and Dust. As soon as sufficient of these different grades have been collected to make an invoice, each grade is taken out of the bins in which it is stored, run through one of the driers to drive off any moisture the tea may have absorbed during the time it has been lying in the bins, and then bulked. Bulking consists of thoroughly mixing the tea so that all the chests of each grade shall be of uniform quality. The tea is then packed in chests, machinery being used to pack it as tightly as possible. This is done by means of a platform to which the chest is clamped and which vibrates very rapidly and shakes the tea down till it lies as closely as possible. This operation completed, the tea passes from its factory stage and enters on the world market.

This industry assumed importance only very recently. During the last two years the number of cashew nut factories has been increasing. It provides
Cashew nut. work for about 20,000 coolies, mostly
omen. There are now twenty three cashew nut factories.
They fall into three groups :—

(1) Direct exporters having their own representatives in New York.

(2) Factories that have formed themselves into a corporation and transact business through a common office. The corporation also does direct export. There are four such corporations composed of about twelve factories now working in the State, viz., the Quilon Cashew Export Corporation; the Travancore Cashew Corporation; the Unique Cashew Mart and Messrs. Baker Bennet Day.

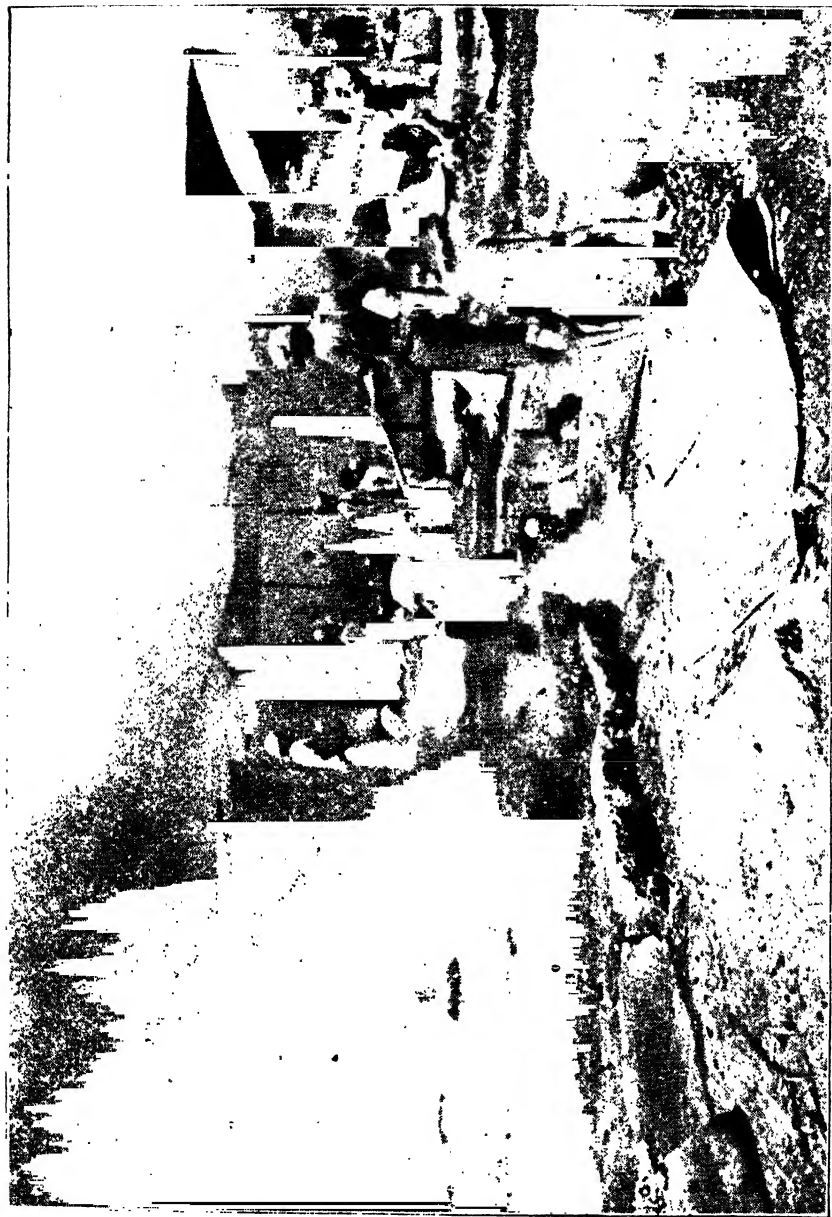
(3) Suppliers to exporters. These factories are mainly engaged in roasting, shelling, removal of the inner coat, grading and packing of the nut. Roasting is usually done in open iron pans over a small circular earthenware furnace. About $\frac{3}{4}$ pound of nuts is roasted in one to two minutes. A small quantity of water is then thrown on the

nuts to extinguish the flames and the pans are emptied on to the ground. Several furnaces work at the same time. Roasting is a process which needs great care as over-roasted kernels are unsaleable in foreign markets. Some factories roast 150 - 170 bags of raw nuts a day. The average-size factory, however, handles only about 50 bags. A few of the bigger factories have recently set up roasters of local make which ensure better control over the process and consequently a greater uniformity in the final product. The fuel employed for roasting is the rind of shelled cashew nuts.

When the roasted nuts have cooled, they are shelled. This is done with wooden mallets, mostly by women. It is an operation requiring great skill as the kernels easily break, and broken kernels fetch a much lower price. The kernels are removed from the shell by hand.

The next process is the removal of the reddish brown coat that covers the kernel. This is done by spreading the shelled nuts over wire-gauze trays in hot air ovens and heating them to a temperature of about 120°F. for four hours. This drying, besides facilitating the removal of the inner coat, drives off excessive moisture and prevents mouldiness in storage. The temperature has to be carefully controlled since at higher temperatures the kernels become brittle and break easily during subsequent operations. The kernels are then removed from the oven and peeled by hand while still warm. The peeled kernels are next passed on to be cleaned and graded. Cleaning consists in carefully removing with a knife any part of the testa that may still be found adhering to the kernels.

Definite grades and standards are recognised by the trade and no ungraded nuts are exported. No machines are employed for grading and it is all done by hand. It consequently requires considerable experience. Size, degree of roasting and freedom from defects are the main factors that determine the grades. The accepted grades with the



Cashewnut Factory.

corresponding number of whole kernels per (lb.) of each, is given below :—

Grade.		No. of whole kernels per pound.
1st quality.	..	200-210
2nd quality.	...	260-280
3rd „	...	300-320
4th „	...	400-450
Butts.	....	...
Splits.	...	...
Pieces.	...	...

‘Butts’ refer to kernels broken in two along the shorter axis, while ‘Splits’ consist of one cotyledon only. The number of counts to the pound is remarkably constant in all grades.

Formerly the kernels were packed in hermetically sealed tins. This proved unsatisfactory, as by the time the consignments reached their destination they were badly attacked by weevils and hence became totally unfit for human consumption. After repeated trials this difficulty was got over by packing in tins charged with carbon dioxide gas. Messrs. Baker Bennet Day of New York have taken a patent in the U. S. A. for this method of packing (known as “Vitapack”) and their chief supplier in Travancore is the only one allowed to use this type of packing. Other exporters desiring to pack in carbon dioxide have to pay to the aforesaid company a royalty of 5 per cent. of the gross value of the goods on consignments entering the United States. All the other exporters in Travancore are, therefore, now packing in vacuum. Tins filled with kernels are vacuumised through a small hole in the lid which is hermetically sealed. This method of packing keeps the kernels sound for over a year, but it is reported to be not so satisfactory as packing in carbon dioxide.

The tins used for packing are mostly made by Messrs. Tata & Co., Ernakulam, and cost about Rs. 45 per 100. After the tins are filled with kernels and are sealed, they are packed two together in dealwood cases; they are finally marked and labelled, thereby completing the preparation for export. The cost of packing tins, dealwood case and labour, works out to Re. 1-12-0 per case. The net weight of a packed case is 50 lbs. One bag of raw nuts (168 lbs.) gives 35 to 40 lbs. of finished product. This works out to a kernel yield of about 23 per cent. on the raw nuts.

The by-products of cashew nut:—The main by-product of the cashew nut is a mixture of seed coats (testa) and small broken pieces and dust of kernels. At present there is no demand whatever for this product and it is being wasted. This is unfortunate, since it is a highly nutritive cattle and poultry food as is obvious from the following analysis of a sample made in the chemical laboratory of the Department of Agriculture, Ceylon.

Water	8·1 per cent.
Proteins	7·6 „
Fat	12·3 „
Carbohydrates	59·2 „
Fibre	11·0 „
Ash	1·8 „

The nutritive value of this product is little known.

Shell oil:—There is hardly any shell oil available in our factories, as a good part of it is burnt away in the process of roasting the nuts and the roasted shells are further used as fuel. The Kurienoleum Produce Co. of Quilon makes a small quantity of shell oil which is used mixed with certain paints. It is reported to be a good wood preservative.

Cashew alcohol:—In the West Indies, Goa and elsewhere a spirit is prepared by fermenting the juice extracted from the cashew fruit. No attempt in this direction has

been made so far in Travancore, but it is a matter that merits careful consideration.

Rancid kernels:—A certain quantity of rancid kernels is available in most of our cashew nut factories. There is very little demand for this at present, but factory owners are optimistic about finding a market for this product in France in the near future.

The manufacture of salt is one of the oldest industries of the State. Salt used to be manufactured not only in the factories known as 'Aļoms' in South Travancore between Cape Comorin and Coļachel, but also at the 'Padanays' situated in the margin of the backwaters in Trivandrum, Chirayinkil, Kaṛunāgappally, Kārthikappally and Ampalapuļa taluks. The salt manufactured in the 'Aļoms' was superior in quality to that produced at the Padanays and no attempt appears to have been made at any time to improve the quality of the latter. The manufacture of salt in those days was free and unrestricted. But the monopoly system was introduced in 988 M. E., which made the ryots indifferent to the manufacture of salt. The local salt industry lost ground slowly. A turning point in the history of the salt industry culture was reached in 1079 M. E. (1904 A. D.) when a new factory was opened on private account. In that year an area of 120 acres was leased out to a company which entered into an agreement with the Government by which the latter has to purchase the whole or a stipulated quantity of salt on payment of a fixed price and sell it to the public as in the case of the old factories, and to levy a duty at the time of issue, when the producers are permitted to sell the excess quantity. This is what is known as the Modified Excise System. Under it all the maṛāmath works in the factories are carried out by the manufacturers themselves, the Government incurring no expenditure except for the preventive staff. The large profit the Modified Excise Factories yielded, when compared with that of the Monopoly

Factories, afforded sufficient inducement to the manufacturers under this system to maintain their factories in good condition and produce as much salt as they could. To enable the change of system being introduced in the Monopoly Factories under legal sanction and to place the old as well as the new factories under a statutory basis in regard to the method of manufacture and thus improve and expand the salt industry in the State, a Regulation was passed—Regulation III of 1088—which grants powers to the Government to supervise the working of the factories from start to finish. After the passing of the above Regulation, other factories came into existence one by one, with the result that at present there are fifteen factories with a pan area of 531·316 acres. Of these two are working under the Monopoly System and thirteen under the Modified Excise System. The subjoined statement gives details of acreage, etc., in respect of each factory:—

Name of Factory	Total acreage	Acreage of pans
<i>Monopoly Factories.</i>		
1. Rāṭakkamangalam	240·48	77·89
2. Colachel	89·75	46·90
<i>Modified Excise Factories.</i>		
1. Old Aḷom	4·54	2·98
2. Old Aḷom Extension	2·43	2·39
3. Swāmy Aḷom	16·98	12·626
4. Kumārī Aḷom	127·42	60·04
5. Thāmārakkulam Extension No. I	170·29	55·16
6. Do. No. II	68·20	31·54
7. Śrī Mūla Krishṇamony Aḷom	65·129	30·00
8. Śrī Śankarā Aḷom	140·00	59·60
9. Śrī Mūlagōpālanāthan Aḷom	120·00	54·95
10. Puṭhalom	22·42	4·42
11. Vāriyār	35·5565	10·98
12. Thaṭṭarippu Ōḍai	53·59	34·93
13. Śrī Chithīra Thirunāl Muṭhuswāmy Factory		
<i>Total</i>	<i>1,296·2155</i>	<i>531·316</i>

Manufacturing seasons.—In all the factories in the State, the manufacture of salt is carried on by solar evaporation in two seasons yearly, i. e., the interval between the closing of the south west and the setting in of the north east monsoons, and the interval between the north east and the south west monsoons. The first is known as the “Pūraṭṭāsi Pāni,” and extends over $2\frac{1}{2}$ months generally; while the second is known as the “Thai Pāni” which lasts for nearly five months. Evaporation is quickest and most effective in the latter part of Pūraṭṭāsi Pāni.

Brine Supply. Of the fifteen factories, ten are situated at Thāmaṛakkuḷam, one at Ājākkamangaḷam, one at Coḷachel and the remaining three near Cape Comorin. These are situated in low lands and very close to the sea. The factories at Ājākkamangalaḃ, Coḷachel and near Cape Comorin get their supply of brine direct from the sea, while the factories at Thāmaṛakkuḷam depend for their brine supply upon the estuary called Maṇakkuḍy Lake close to the bar. Thāmaṛakkuḷam with ten factories has got natural facilities of its own for the manufacture of salt. The estuary serves as an outer reservoir for Thāmaṛakkuḷam factories from which brine is conveyed through channel to the inner reservoir of each factory, whence the pans are irrigated. The factories do not get strong brine on most occasions during the working season. The estuary is inconstant as a source of brine supply, on account of the contamination of fresh water. Since the fruition of the Kōthayār Irrigation Project, the Maṇakkuḍy Lake is, with the exception of occasional short intervals, filled with fresh water throughout the year. There is also trouble from fresh water percolation in the Ājākkamangalaḃ and Coḷachel factories, on account of the proximity of the Kōthayār Irrigation channels to these factories.

The dilution of brine in the lake, which threatened to reduce the output, was the occasion for looking for other sources for the supply of brine. Fortunately for the

licensees, most of them get a plentiful supply of brine of high density from wells sunk in their factories which formerly formed the bed of the lake. The factories at Thāmaṛakkuḷam are, therefore, getting brine from the wells for supplementing the brine in the estuary.

Process of manufacture. The salt works are arranged in rows of pans called condensers and crystallisers of equal dimensions of one cent, each crystalliser being mated with a condenser in all the Modified Excise Factories. The condenser is on a higher level than the crystalliser. This is done in order that the brine may freely flow into the crystalliser from the condenser. Brine is first irrigated to the condensers from the reservoir by means of feeding channels and it is allowed to concentrate there till the brine reaches 18° F., when the calcium salts are expected to be deposited. Then the condensed brine is passed into the crystalliser to a depth of about four inches, where the crystals of sodium chloride are formed. This process of crystallisation is allowed to continue until almost the whole of the sodium chloride is deposited. The salt crystals are raked with wooden scrapers and heaped on the ridges to drain and the bed is irrigated with a fresh supply of brine. The crystals are then removed to the drying ground and placed in long narrow heaps to dry. When the crystals are completely dry, they are removed to the storage platform and stored after weighment in heaps of generally 1,200 maunds. The heaps are then thatched with coconut leaves and allowed to remain there in store, until the salt is removed for sale or transport to the depots in various parts of the State.

The irrigation and scraping are repeated once in six or seven days according to weather conditions. It takes ten to twelve days for scraping salt from the time of irrigating the condenser. The process of scraping after each irrigation is called single irrigation method. The brine that remains in the crystallisers is thrown out after

the fifth scraping, to prevent the incorporation of magnesium salts with the sodium chloride.

Production and consumption of salt:—The annual consumption of salt in the Sate is about 12 lakhs of maunds. Till the year 1110 M. E. the output in the factories never equalled the annual consumption. The deficit was made good by importation from Bombay and Tuticorin. The chief impediments for the successful working of the factories are (i) insufficient supply of good brine, (ii) percolation of fresh water from the Kōthayār Irrigation channels, (iii) adverse weather conditions. In spite of these adverse circumstances, the factories are now yielding more than the quantity required for consumption in the State. The following statement gives the yield of the factories, the import from outside and the consumption in the country for ten years ending with 1111 (1935-1936).

Year	Yield of the factories Mds.	Quantity imported Mds.	Consumption Mds.
1102	6,78,380	5,53,134	11,28,733
1103	9,87,515	6,43,049	11,81,124
1104	7,64,413	5,18,375	12,16,769
1105	7,93,965	3,10,701	11,99,800
1106	10,11,249	2,38,780	11,94,444
1107	11,63,044	2,26,623	12,00,611
1108	7,43,857	1,93,909	11,67,558
1109	8,70,614	4,95,913	11,969,42
1110	17,10,654	2,13,262	11,72,708
1111	13,38,358	87,489	12,14,721

As enterprising capitalists have entered the field of salt manufacture and as the industry yields very attractive returns on the money invested under normal conditions, the future of the salt industry is very hopeful. The question that has now arisen for serious consideration is whether the

industry can still further be expanded without finding markets outside the State for our surplus stock. It may not perhaps be difficult to come to an understanding with the governments concerned for the sale of Travancore salt in neighbouring territories.

The mineral possibilities of Travancore are great. So far they have been only insufficiently exploited. The sands of the beach contain some of the most valuable minerals. The deposits of monazite are by far the richest in the world both in regard to the quantity available and the proportion of the thoria content therein. Big deposits of graphite have been found in the Nedumangād taluk and it is expected that unworked deposits are still available for exploitation. Travancore plumbago should be an attractive proposition to an adventurous spirit. A collection of Travancore plumbago, both crude and refined, and a magnificent series of crucibles and other articles manufactured from it are exhibited in the Government Museum in Trivandrum.

The mica that has been exploited in the State by different people at various times is what is known to mineralogists as Phlogopite Mica, usually amber coloured. Travancore Mica is not free from the defects of buckling and inclusions of foreign bodies. In the Madras Government Museum, however, is exhibited a fairly large sheet of phlogopite from Travancore without any buckling or inclusions of foreign bodies. As it is eminently suited as an insulating material, it is highly useful in the electrical industry. There are unworked deposits of mica in many parts of the country, but there are only very few persons who are engaged in this industry.

Magnetite, an extremely valuable ore of iron, occurs diffused in rocks in different localities, but never in a concentrated form to be available for an iron industry. In some localities it is brought down from hills and is found

associated with quartz and other minerals in the sand in brooks, and a prosperous iron smelting industry seems to have been carried on in different localities. One may point out in proof of this the heaps of slags on the road from Mylāḍy to Maṛungūr in Agasthīśwaraṁ taluk, for long utilised as road material.

The red sand which attracts almost all the visitors to Cape Comorin, known to mineralogists as garnet, seems to have been exported for the manufacture of sand paper; now, however, no attempt is being made to collect it for this purpose.

All these minerals pale into insignificance in comparison with some of the so-called rare minerals in which Travancore is rich; and of one or two of them she is holding a practical monopoly in the mineral industry of the whole world.

Monazite:—Of these the best known is monazite, a phosphate and silicate of the rare earths ceria, yttria, lanthana and didymia, while thoria is invariably present in varying proportions. The associated minerals, ilmenite and zircon, are finding an increasing market in Europe and America. Monazite is found in the pegmatites running through the granites of the country in association with mica, ilmenite, magnetite, zircon and other minerals and the deposits of workable concentration should be ultimately traced to these pegmatites, small or large, occurring all over the country along the sea-shore. Some of these found in Thōvāla taluk are so rich in monazite that at one time proposals were entertained for exploiting them. But, in the face of the steady decline in the price of monazite, it was realised that the mineral thus won had no chance of standing competition with the mineral found in loose grains in the coastal deposits.

Monazite is highly valued as the source of all thorium compounds of commerce and at present Travancore is the only country from which it is obtained. Thoria or thorium

oxide forms ninety-nine per cent. of the incandescent gas mantles; the other one per cent. is mainly ceria or cerium oxide from the same mineral monazite. During recent years, owing to the progress of electrical lighting, demand for thorium oxide has steadily declined; and unless some new use is found in some industry where either thoria or ceria can be used in large quantities, one must say that monazite has left its best days behind. A new use for thoria has been found in the manufacture of crucibles and other refractory articles which have a chemical resistance against basic compounds and can be used at a temperature over 2,500 degrees centigrade. Ceria is used in manufacturing pyrophoric alloys. Other minor uses of cerium compounds are found in 'flame arc' lighting, in textile industry and also in dye making, photography and medicine.

During recent years titanium oxide has come into great prominence as a white pigment and is steadily displacing white lead, zinc white and barytes. It is completely non-poisonous and has maximum opacity and obliterating power, fine texture and great chemical stability. It is practically insoluble in acids, is not affected by heat and retains its brilliant whiteness under the most drastic conditions. Rutile is pure titanium oxide, so also are anatase and brookite, but these minerals are not found in a sufficiently large scale to form the raw materials for the pigment industry to produce titanium oxide to compete against the long standing white lead and zinc white industries.

Ilmenite. The black mineral found in such large deposits near Kōlithōttam, Panmana, Chavara and Nīṇḍakaṛa, from Coḷachel to Kaḍiapaṭṭaṇam and also near Cape Comorin, is an iron titanium oxide. For a long time no process was found cheap enough to separate the iron from titanium. Some fifteen years ago methods were perfected which were highly successful in completely removing the iron, and a very prosperous industry has grown round ilmenite as the only commercial source of titanium oxide; and Travancore

with her vast deposits of ilmenite sand easily worked and cheaply transported has taken the leading place for feeding the new industry. Titanium oxide is used in enamels, lacquers, printing inks, inlaid linoleums, glass, ceramics, cement, artificial marbles, golfballs, white rubber goods, synthetic resin plastics, boot and shoe dressing, leather finishes, soap, cosmetics, paper, paint and artificial silk. Other minor uses of titanium are found in the manufacture of ferrotitanium alloys, mordants in textile industry and in electric lighting industry to a small extent in America.

Zircon, a silicate of zirconium, occurs associated with monazite and ilmenite in the vast deposits found along the sea-shore. Beautifully perfect crystals are found at Appyōde in South Travancore. Of late, this mineral has come into importance in the refractory manufacturing industry, the earlier difficulty of finding a suitable binding material having been overcome. A crucible made locally as early as 1919 and experimented upon is exhibited in the Trivandrum Museum. Since then it is evident that methods have been perfected in Europe and America, as the mineral which is a by-product in monazite industry is being exported in increasing quantity every year.

Besides the above minerals, indications are not wanting that uranium, radium and tantalum minerals do occur in Travancore, and a thorough investigation will have to be carried on to determine the extent of these. Nickeliferous pyrrhotite with traces of silver, lead and copper occurs in one or two localities, but this seems to be of scientific interest only at present. Molybdenite also is present associated with this pyrrhotite. Spinel was found associated with graphite in the Vellānād mines, so also gypsum.

A very minor industry seems to centre round chrysoberyl or cat's eye in the neighbourhood of Trivandrum. This semi-precious gem is of beautiful yellow colour with the very narrowest of silver lines running across and is

highly prized by collectors. Chalcedony in blocks occurs near Athappallam in Kalkulam taluk.

Where temperature over 1,500 degrees centigrade is required, carbon or graphite has been utilised as material for the construction of vessels. High refractoriness, insensibility to change of temperature and relative cheapness ensure for both carbon and graphite an importance that is not easily surpassed by other materials. Susceptibility to oxidation and the formation of carbides on contact with various metals are its chief drawbacks. Also the melting of carbon free metals or alloys, the fusion of glasses, slags and certain other operations cannot be carried on in crucibles manufactured of graphite. Hitherto for such operations dependence has been placed on crucibles and other vessels made of the so called fire-clay or clay mixed with highly refractory substances. The highest practical working temperature of such articles as were made of these does not reach more than 1,600 degrees centigrade, and where higher temperatures are required other highly refractory materials must be employed.

Of late, aluminium oxide, beryllium oxide, zirconium oxide, magnesium oxide, thorium oxide, and zirconium silicate have come into prominence, each material having its special application. Of these Travancore can manufacture thorium oxide and zirconia or zirconium oxide. Zirconium silicate is found in nature as the mineral zircon, while magnesium oxide and beryllium oxide can be manufactured out of the minerals magnesite and beryl found in sufficiently large quantities in South India.

Zirconia or zirconium oxide will stand up to a temperature of 2,500 degrees centigrade before it begins to melt. In contact with alkaline and acid substances even at very high temperatures, vessels made of zirconia possess a very high power of resistance. Glasses and basic slags may be

melted in them for a long time at a temperature above 1,700 degrees centigrade without any appreciable injury being visible.

Vessels made of zircon will stand a temperature of 1,750 degrees centigrade. This mineral possesses a very small coefficient of expansion and hence articles made of it will withstand sudden changes in temperature without any danger of cracking. For fusions of all kinds of metals zircon crucibles and vessels are highly recommended.

Thoria or thorium oxide derived from monazite has a very high melting point round about 3,000 degrees centigrade. Crucibles made of thoria are effected by carbon at high temperatures by forming a coat of carbide. In contrast to vessels made of zircon, those of thoria are affected by sudden changes of temperature.

Ilmenite is co-extensive with monazite; in addition there are vast sand dunes which contain this black mineral to the extent of about 70 per cent. and more. Zircon is also found along with these. These minerals are now worked by a few concerns which export them to foreign countries. Mica of good quality is being mined by one concessionaire.

At Punalur there is a paper mill. This is one of the five paper mills in India. It is run by water power, steam and oil engines. The output of this mill is

Paper. not sufficient to meet the demand for paper in the State. The Punalur Paper Mill does not suffer from scarcity of raw materials, which is one of the permanent complaints of the other paper mills in India. There is an abundant supply of wood pulp, reeds and suitable varieties of grass in the forests of Travancore. At present the mill produces only low grade papers and even that at comparatively high prices.

There are nearly a dozen match manufacturing concerns in Travancore. This is a growing industry in

the State. The Industries Department is in possession of
Match. formulæ for damp proof match heads and
striking surfaces.

The possibilities of rayon industry have been realised.
Wood pulp, the soft woods of the jungles, the bamboos and
Rayon. reeds of the country afford enough material
for a brisk and active Rayon industry.
Sir Victor Sasoon has opened a mill at Alwaye for this
purpose.

The labour conditions of Travancore are fairly
satisfactory. Labour is generally well housed, well paid
and well treated. The labourers are on the
Labour. whole better educated, more intelligent
and better able to look after their interests. The sanitary
arrangements in the factories are generally satisfactory.

Men women and children are engaged as labourers
in factories. The average rate of daily wages varies from
3 as. to 4 as. per head for adults and from 2 as. to 4 as. per
head for children. The duration of working hours varies
from 8 to 10 hours a day.

There are two labour associations in Travancore but
it is a matter of doubt whether they are fully representative.
There has been recently trade disturbances in the country.
Legislation was therefore undertaken to protect the interests
of labour and industries in the State. The Factory Regula-
tion was amended to bring it in line with the Indian
Factories Act of 1934. The Trade Disputes Regulation was
also passed, devising certain provisions for the investigation
and settlement of industrial disputes. The Travancore
Trade Unions Regulation VIII of 1112 was passed to pro-
vide for the registration of Trade Unions and to define the
laws relating to Trade Unions in Travancore.

COTTAGE INDUSTRIES

Attention has so far been paid only to those industries which are being carried on a large scale in factories. However imposing the enumeration of these may be, the fact remains that the average ryot is hardly affected by these and the villagers may not even be aware of their existence. These people are all agriculturists, but they are not strangers to other industries. They, more particularly the women-folk, pursue small industries in their own cottages, to which they devote the leisure at their disposal. It would be a difficult task indeed to classify or enumerate the many kinds of small industries that bring an additional anna or two to the meagre income of the poor cultivator. There are some classes of people who care little for agriculture and engage themselves as whole time workers in their little avocations. But to the large majority, cottage industries furnish a subsidiary occupation.

There are numerous cottage industries spread throughout the State. Probably there is no other State in India which can show such activity and such wide variety in respect of its cottage industries as Travancore. "Various cottage industries have for centuries obtained a firm foothold in the country and cotton weaving and coir making, wood and ivory carving, screwpine work and carpentry are well known for their artistic excellence throughout the world; and, during recent years, the enterprising fishing community has, under the farsighted supervision of philanthropic agencies, developed the lace industry which has acquired a name for delicacy and durability."*

Hand loom weaving is the most important of the cottage industries in vogue. The artisans engaged in this are adepts in the art. They work with cotton and silk and the exquisite gold lace works dexterously wrought on the borders,

* Broadcast talk given by Sir C. P. Rāmasvāmy Aiyer, K. C. I. E., on Travancore from Bombay Radio on September 27, 1936.

with floral and other decorative designs, are a delight to the eye. The industries associated with the use of soft but durable leaves of the screwpine provide occupation for a very large number of people. Lemongrass oil for which the State is famous is obtained by distilling the grass in the many stills distributed over several taluks. Soap manufacture which is generally recorded as a highly skilled factory industry is carried on as a cottage industry because of the abundance of its cheap raw material, coconut oil, which by the ease with which it can be saponified lends itself for utilisation on a small scale without recourse to expensive, or elaborate machinery. The bell-metal industry produces wares which are famous for their finish, polish and lustre. Travancore is also justly renowned for its fine art work, particularly in ivory, carving and kufthari work. A few of these more important cottage industries are very briefly described below.

Travancore is noted for its weaving communities and its weavers. The weavers of Travancore claim that their industry was begun by the original ancestor of their race, the Chāliya Rishi. As far as possible the weavers cling to their original methods of work and it is only with great persistence that they can be persuaded to make any improvement in their methods. As a matter of fact the shuttle loom is the only improvement thus far introduced in the method of weaving. *Munduṣ thārthas* and finer varieties of cloth known as *n̄riathas* are woven by them. Most of the weavers do their work as a cottage industry and as such they own their looms and work independently. They usually have other interests, such as land, and invest most of their money in landed property. The consequence is that there has been a deterioration in the class of workmen. The industry has also suffered. The locking up in land of the money earned has been a great factor in the decline of the industry, for it left no capital

free for the development of the calling. There are many cloth merchants in Vaṭṭaśśēry who collect the finished goods and finance the industry. There are also yarn merchants and bankers. Of 14,636 workers, only 1,070 are employed in organised industry and the remaining 13,566 are all cottage workers. The workers are composed of 12,768 males and 1,868 females, which gives a ratio of 146 females to 1,000 males. There was a time when Travancore was able to produce all the clothes she required and even more. But the indigenous hand loom industry began to languish and continued to decline with the advent of cheap mill-made clothes. The census returns practically show no increase in the number of persons following weaving as their principal means of livelihood. The number was 14,713 in 1921 and 14,636 in 1931. Weaving has, however, been accepted as a subsidiary occupation by a number of persons in recent years, and according to the Census of 1931, there are 1,588 such persons. If these are added to the full time workers and their helpers, the total number in 1931 shows an increase of about 10 per cent. over the figure for 1921.

As a cottage industry, cotton weaving is practised extensively throughout the State, particularly in South Travancore. In view of an abundant supply of inherited skill in certain special localities, an assured home market for the kind of cloth that they make, and the comparatively low cost of production, the cotton weavers should, in normal times, be able to convey the impression of a prosperous community. Unfortunately, in recent times they have been far from prosperous. They are handicapped by lack of organisation and lack of finance. Their markets have been flooded with foreign piece goods and Khadar cloth. Khadar is proving a serious competitor to the kinds of cloth turned by our cotton weavers. The Government opened weaving depot in Meḍam 1095 at Irāṇiel. The aim of the institution was to impart instruction to the weavers of the

locality in improved methods of weaving and design. It was practically identical in scope and aim with the S. M. R. V. Technical Institute at Nāgercōil. The two institutions were amalgamated. In view of the importance of propaganda work in the matter of introduction of improved methods and the use of improved implements in regard to weaving, a peripatetic officer was appointed in 1095 to inspect fly shuttle looms, to suggest improvements in them, and to teach their owners how to mend them and supply them with missing or broken parts.

The Government encouraged weavers of the backward communities by supplying, hire looms and accessories to the Pulaya community in 1101. The Industries Department gives technical advice and has introduced new methods of warping and weaving and sewing together with improved looms so that production may be increased and cheapened. Weaving schools have been started to which the Government gives grants. An itinerant weaving party imparts instruction in the theory and practice of weaving and in improved methods on fly shuttle looms using different kinds of dobby and jacquered machines.

The history of the introduction of this industry may be briefly stated. About three hundred years ago, six families of silk weavers, Saurāshtra by caste, were brought down from Dēvagiri by the Rājā of Travancore and settled at Kōṭṭār, near Nāgercōil, for making silk garments for the royal family. They were given land free of tax and other conveniences to make them feel at home. These weavers got enough work to do and prospered. Seeing their prosperity more families came from Dēvagiri and in a couple of decades Kōṭṭār became a thriving village of silk weavers. This small community continued to increase in population, while the demand for their silk fabrics began to decline, as very few people except the royal family and a limited number of rich

Silk weaving.

nobles could afford to buy costly silk and gold-thread fabrics. The weavers had, therefore, to resort to weaving coarser cloths to earn their livelihood. In the meanwhile, the English spinners introduced into the Indian markets fine counts of cotton yarn which ultimately replaced the expensive silk yarn in the manufacture of fabrics.

Imported cotton yarn was as fine as silk and was about five times cheaper than the latter. The low cost of cotton goods made it possible even for ordinary people to buy them. The Royalty and the noblemen who were once the sole patronisers of the silk brocades also took to the use of fabrics of fine cotton. The demand for these articles increased rapidly and the weaving of cotton of fine counts became the prominent and flourishing industry of the silk weaving community of Kōṭṭār. When it was found that fine cotton weaving was a profitable occupation, many people other than the professional weavers made weaving establishments in their own homes. The Śāliyas, the Paṭṭāryas, and even the Muslims of South Travancore, became weavers in this manner.

The fine counts of cotton yarn which replaced silk are now being seriously menaced by the competition of artificial silk. It is only a couple of decades since the production of artificial silk has become a commercial success, but during this short period it has established its popularity. Its gloss, lustre and feel are so like those of natural silk that it is often difficult to distinguish one from the other. It takes dyes in any grade and shade; it can be bleached and it is very cheap, being about 50 per cent. cheaper than fine cotton yarn and as much as eight times cheaper than natural silk.

The weavers of Kōṭṭār used to get their silk from Kollegal in the Madras Presidency, Mysore, Bengal and even from far-off China, but the gold and silver threads used in silk weaving were made locally. Unfortunately, this industry has become practically extinct as a result of the

competition of cheap gold and silver threads imported from France and Surat. There are still a few families who know the secret of making these threads and they do make them occasionally when necessary.

Silver thread is made out of silver and lead. These metals in proper proportions are melted together in a crucible and solidified into rods as thin as possible. The rods are drawn out into wires by pulling them through holes of different sizes punched into a steel plate, the smallest hole being so small as to admit only a hair to pass through. This process is repeated until the wires assume the shape of fine threads. They are then beaten out into flat tape-like filaments and are wound spirally round the silk or cotton yarn. The silver thread thus prepared is subjected to the action of saffron fume when it takes the golden yellow colour. The quality of the thread depends upon the proportion of lead and silver used. The larger the quantity of lead, the poorer is the quality of the thread and the cheaper is its price. In no case will lead exceed 40 per cent. by weight of silver.

Gold thread is also made in the same manner as silver thread but without lead. Silver is melted and converted into thin rods about one foot long and a quarter of an inch thick. They are then covered with thin gold leaves and drawn out into wires on a special appliance described below.

Two wooden rollers six to eight inches in diameter and eight to twelve inches long, fitted with handles at one end, are mounted on frame, one foot apart. At the centre of the space between the rollers is fixed a metal plate containing a row of holes called 'eyes' of varying sizes. The gold-coated silver rod is wound round one roller and the outer end of it is passed through the largest 'eye' on the plate and tied to the other roller. The latter is turned gently until the whole length of the rod passes through the 'eye' and is

transferred from the first roller to the second. Again, the thread is passed through the next smaller 'eye' and transferred back to the first roller. This process is repeated forward and backward alternately until the thread gets the required fineness. To make very fine threads metal plates containing holes set with tiny pieces of precious stones are used. Such plates are imported from France at a cost varying from Re. 1-8 as. to Rs. 25 each, according to the fineness of the 'eye' and the kind of precious stones used. The thread is beaten out gently into a flat tape-like filament, which is wound on a small drum called the 'Swift'. The axle of the 'swift' projects out on either side; one end of it is fixed in the ground and the other end is turned by hand. The final process consists in covering yarn with the gold thread, and this is done on a spindle made of bamboo pole. The bobbin on which the yarn is wound is fixed at one end of the pole and the one on which the gold tape is wound is fixed at the other end. The outer ends of the yarn and gold tape are attached to a takli-like spindle, and when this is turned by hand, the yarn gets covered by the gold tape. The thread thus formed is rewound on a swift or a board of lathes and again on a reeler. The thread is then subjected to the action of saffron fume to improve its colour and lustre. A mixture of saffron powder and a kind of red earth called 'Kāvi', a hydro-silicate of aluminium and iron, is sprinkled on a small heap of rice husk which is burned slowly so as to produce copious fumes. The burning rice husk is covered with a perforated earthen pot and the thread is exposed to the fume emerging from inside the pot until it gets the desired colour and lustre.

Preparation of the silk yarn. Silk yarn is first boiled in water to improve its colour and, if coloured yarn is required, it is also dyed. Formerly, indigenous vegetable dyes were used, but now aniline dyes have replaced them.

Prepared silk warp is now imported from Kumbhakōṇam and other places. It is boiled in a solution containing

Washing soda	15 tolas
Alum	15 „
Lime	2 „
Water	6 gallons.

These are the quantities for one pound of silk yarn. The solution, after it is made, is kept in shallow pans in open air for about eight days, when by the action of the carbonic acid gas of the atmosphere the lime in the solution is converted into chalk and precipitated. The clear liquid is decanted into another vessel and more water added to make up the loss by evaporation. The silk yarn is boiled in this solution for a couple hours, washed well with water and dried in the shade.

The method of warping adopted by the silk weavers is ingenious and the implements used, though crude, are well suited to the handling of such delicate materials as silk yarn and gold thread. The silk hank is held stretched on two bamboo pieces mounted on stands. The distance could be adjusted to suit the loop length of the hank by shifting the stand.

The outer end of the yarn is passed through a small tube of reed. The opening at the ends of this tube are made smooth by being set with glass beads. The warping frame consists of a rectangular board with five or six rows of wooden spikes, six to eight inches long fixed at right angles to it. The reed tube containing the gold thread is drawn along the board passing it above and below every alternate spike. When the last spike on the board is reached the process is reversed, and this is repeated as many times as the number of threads the warp should contain. The warp is taken out of the frame by transferring it from the spikes to the lease rods, of which as many are inserted as there are spikes. It is then rolled into a ball warp and gaited on the loom.

Silk is woven on ordinary pit looms. The loom accessories, such as reeds, shafts, shuttles, etc., are made

by the weavers themselves. The rod is made of thin bamboo. The shuttle is made out of the stem of a reed grass locally known as *iral*, and its two ends are plugged with pieces of light wood. The shuttle is also provided with a spindle to take the weft pirns. The thread guide, or the 'eye', is made of glass beads inserted into the side of the shuttle.

In weaving fabrics with designs of gold lace borders, a contrivance somewhat similar to the Jacquard machine is used. The border threads are passed through the 'mail eyes' on the harness threads. The warp threads, at the ends of which weights are attached, are connected with the harness threads so that when the weights are pulled down the corresponding harness threads are raised. The weaver keeps in mind the particular design to be worked in and as per his instructions a boy pulls down the particular warp thread for every pick or throw of the shuttle. In this manner the design is worked into the fabric. The Jacquard machine of the present day is only an improvement on this crude contrivance.

Frilling. The loose ends of the threads of woven fabrics are frilled into some artistic forms. The type of frills depends upon the quality of the fabric.

The economic aspects of the industry. A skilled weaver will weave one and a half yards of silk, three yards of cotton or four yards of artificial silk in a day of eight working hours and his daily income will, therefore, amount to six to thirteen and a half annas from silk, four and a half annas from cotton, and three annas from artificial silk.

Silk weaving is more profitable than cotton or artificial silk weaving and yet the silk weaving industry is declining, mainly because of the lack of organisation among the weavers in advertising and marketing their goods and their inability to find the capital required for the investment, which is considerably more than what is necessary for the other weaving industries.

The lace and embroidery industry as seen in Travancore is not found in great variety, but on a rough computation it provides occupation for about 12,000 women and girls and a small number of boys and men. In none of its forms is it an indigenous art. Chronologically, Syrian embroidery was the earliest to find its way into Travancore, having been introduced early in the Christian Era by the colony of Syrians who settled in this land. It now exists only as a relic of past traditions. It does not seem ever to have had a marketable value. Syrian women who follow old-fashioned styles still adorn their jackets with this stitchery, especially for their bridal attire. It is interesting to note that the embroidery has retained the purity of its form through centuries and is to-day exactly the same as the work done in the countries bordering on the Eastern Mediterranean.

All the other forms of lace and embroidery in Travancore are purely of European origin, except a very little gold embroidery after the Muhammadan fashion that is occasionally seen, and is mostly imported, and can, therefore, be omitted from this account.

Pillow Lace This is the most extensive of the industries. Its introduction dates back to nearly a century and a half ago. No accurate information is available as to when and by whom it was first taught; but there seems to be no reason to doubt the story that it was taught by the Dutch and the Portuguese ladies who settled in the coast towns of Anjengo, Quilon, and Alleppey during the 18th century, to small classes of girls (slaves, perhaps, in those distant days), and that the finished product was used by the mistresses themselves. The old industry has languished and flourished alternately ever since. It has also deteriorated in design, in stitch and in material, so much so that now it is in a class of its own and is known as "Quilon Lace". The only points in its favour are that it is hand-made, cheap, and a cottage industry giving occupation to several hundred girls and women who eke out a living by its means.

The beginnings of modern lace-making are due to Mrs. Mault of the London Mission Society, who began to teach the work to the poor women and girls of the Mission at Nāgercōil in 1821.

A further revival of the industry was made within the last quarter of a century by the Belgian nuns who opened a Convent at Muḷagumūḍu, a place between Trivandrum and Nāgercōil. Young nuns trained in the art in all its historical aspects and modern developments and trained to understand the latest taste, fashions and market centres are being frequently recruited from Belgium. The form of their organisation also helps to preserve beautiful quality. There is an orphanage, "The Infant Jesus Orphanage" containing over 350 girls who are all taught lace and embroidery. On marriage a part of the dowry is always a complete lace-making outfit and the girls carry on the work as a cottage industry. Every new pattern is taught at the orphanage under the direct tuition of the sisters. All materials are supplied by the Convent, and invariably they are of the best quality. The Muḷagumūḍu Convent has given a great impetus to lace-making in all its centres and is proving a strong incentive to improved methods of work. There are branch Convents at Cape Comorin, Nāgercōil, Āśāripallam, Palliāḍy, Mariāpuṛam and Kulaśekharam. The kinds of lace made are Torchon, Bruges, Hointon, and Duchese.

Imitative institutions are many; e. g. the Salvation Army Industries at Nāgercōil and St. Joseph's Convent at Alleppey, to mention only the more important ones.

Net Laces:—Darned net laces have long been known as an industry carried on in a desultory fashion as a supplementary occupation by the pillow lace makers of Quilon, Anjengo, and Alleppey. The Convents in these places are now doing this work in a more systematised manner, especially the Convent at Alleppey, from where the best darned net laces come.

The Muḷagumūḍu Convent makes the finer varieties of net laces, and is so far the only institution that produces Limerick and Carrickmacross laces.

Embroidery.—The embroidery industry was commenced by the London Mission Society at Nāgercōil. Like the lace it is a purely cottage industry. Materials and patterns are provided from the head station to which the women return the finished work. They have at present four centres for embroidery work, i. e., Neyyūr, Mārthāṇḍam, Pāraśśāla and Trivandrum. The Muḷagumūḍu Convent pursues this industry also and teaches it in its several forms of Mount Mellic, Broderie Anglaise, Richelieu, and Roman Embroidery.

Drawn Thread Work.—Though known to individual workers and long used at the Trivandrum Friend-in-Need Society's workshop to elaborate the hemstitching they did to extend fine hand sewn lingerie and bed linen, the Salvation Army of Nāgercōil were the first to take it up as a serious industry. The Swedish and the Danish ladies who came out to the Missions were great exponents of this art. Its most important centre is still Nāgercōil, but the imitative institutions scattered about the country are rapidly adopting it in their industrial schools.

Church Embroidery.—There is only one institution for this work—the one at Changanāśśēry. Gold, silver, jewels and coloured silks are all employed by the workers and the very best of damask silks are used for the ground. Strangely enough, while in all other lace and embroidery industries in Travancore the workers are women and girls, in this one they are boys. A priest is in charge, who gets his training in Europe. Their church vestments are very handsome and are all made in the usual traditional designs. The boys show considerable technical skill but there are signs of the same danger overcoming them that has overtaken the Quilon pillow lace industry, viz., the lack of instructors trained in the history of the art. False stitches, impossible designs

and incongruous mixture of materials are seen in all the articles they make.

Crochet, Knitting and Totting:—These only remain to be noticed. None of them has risen to the importance of an industry. They are all still a home occupation for leisure moments and are used for ornaments, household linens and lingerie by the workers themselves and their friends.

The Convents, the London Missionary Society and the Salvation Army are responsible for what organisation there is to-day in the lace and embroidery industries of Travancore.

This is a very ancient industry the origin of which is not known. There are several images made of copper, brass and bronze throughout the State, which are excellent in conception and execution. In making utensils of large dimensions none can excel the Travancore craftsman. The “*Vārpas*” (shallow basins of hemispherical shape), remarkable for their large size, available in the temples of Trivandrum, Amabalapūḷa, Vaikom and other places, and the beautifully worked images seen in some temples point to the high degree of perfection which the art has attained in Travancore. The workers make several grades of the alloy, according to the proportions of copper and zinc, or copper and tin used. The alloy of copper and zinc is known locally as ‘*Picchaḷa*’ or brass and the alloy of copper and tin as ‘*Vellōḍu*’ or bronze. There are several grades of ‘*Picchaḷa*’ and ‘*Vellōḍu*’. The difference between the two and their exact composition are sufficiently well-known to the workers, though the grades of brass are not distinguished by such nomenclature as ‘Alpha brass’ or ‘Beta brass’ as in the west.

Both brass and bronze casting are carried on by men of the same caste who live scattered throughout the State. The principal centres, however, are Nāgercōil, Vāḷappalḷy (Changanāśśēry taluk), Mānnār (Thiruvalla taluk,) and Mūvāttupūḷa.

Brass Casting:—Before the importation of brass sheets from the west, malleable brass used to be manufactured here; but it is no longer done unless specially ordered. All hollow brassware and domestic utensils are now manufactured out of imported brass sheets. But even this industry has suffered by the competition of articles imported from British India, where the manufacture of brassware is flourishing better than in Travancore. The only place in Travancore where articles are manufactured out of sheet brass is Kōṭṭār near Nāgercōil. About 15 to 20 families are engaged in this work. The artisans here knew the proportions of 'solid solutions' of copper and zinc to be used to produce malleable brass. But it is no longer needed because of the importation of brass plates; nor could it compete with the machine-made brass sheets. Brass casting for the purpose of making sheets has, therefore, practically died out.

Casting of non-malleable brass for the manufacture of oil lamps, domestic utensils, etc., still lingers, though it is rapidly declining on account of the cheaper imported articles and substitutes. As brass vessels are easily attacked by weak acids, the inside of the domestic utensils has to be tinned before they could be used, and few people care to have them now when they can have bronze utensils which are better able to resist the action of weak acids.

Brass hinges, locks and a variety of other goods which used to be manufactured locally, are imported in large quantities, and the local manufacturers find it well nigh impossible to produce articles that can compete with them. The uniformity and finish of the machine-made articles cannot be expected in hand-made ones, unless a considerable amount of labour is spent on them, which will never pay. The non-malleable brass casting industry is also, therefore, declining. The purpose for which brass is now cast, though rarely, is for making oil lamps, images, toys, spittoons, etc.

The alloys of copper and zinc result in a remarkable series of colours, the most notable being the one that simulates gold. The naked flame dancing on burnished brass lamps has its picturesqueness and fascination even in these days of electric lights. But it is only on festive and ceremonial occasions and in temples that these lamps are now used. However, it cannot be said that brass casting thrives, or is likely to thrive unless there is a growing demand for hand-made articles and the industry is suitably organised to withstand the competition from outside and the manufacturers instructed to make articles to suit modern tastes.

Bronze casting :—The use of bronze dates from very remote times. It was largely used in the manufacture of domestic utensils, bells, lamps, plates, etc. Some of the more common domestic utensils of bronze which are now seen in ancient families are lamps, *lāṭṭās* (cups), *kinṭies* (spouted pots), *thalikas* and *kinṇams* (dining plates), *piḍi monṭha* (narrow-mouthed jugs), *uṇṇies* (basins), pansupari (betel nuts) plates, sandal vases, ladles, etc. They are made in several shapes according to the fancy of the manufacturer or the buyer. Such utensils are still largely used, but a change in their shape is perceptible. Remarkably large *vārpas* (basins) are used commonly in temples, but as there is little demand for such large vessels except for festive occasions in temples, they are not usually made and the methods are being forgotten. Only very few families of smiths are now able to cast them.

There are also to be seen in temples large bells and statuettes posed conformably with the śāstraic principles. Decorated lamps, chandeliers and lamps like coniferous trees are also common. Beyond these, it does not appear that fine art in bronze casting was developed to a high degree. One does not ordinarily meet with elaborate decorations in bronzeware of fine art independent of religious motives.

Process of manufacture.—Bronze is an alloy of copper and tin, the proportions varying according to the nature of the articles to be manufactured; but ordinarily it consists of ten parts copper and two parts tin for domestic utensils, and ten and five for *Āranmulā Kaṇṇāḍi* (the metal-mirror). This alloy has a rich golden colour and is capable of being worked by a process not applicable to the component parts. The density and hardness are such that it will take even delicate impressions from a mould.

The process of manufacture is known in Europe as *cire perdue*. It has been employed in this country for centuries. Each family engaged in it has its secrets, some of which have perhaps been already lost. The basic principle is, however, well-known.

A 'core' representing the form as well as the size of the article to be manufactured is first made in clay. Wax is overlaid on it and on the wax are worked the required designs. The wax is then covered with soft clay in several layers. This is the mould. Through an opening provided in the outer wall the wax is drained out by heating the mould, and it is then filled with the molten metal. The details of the process, as it is practised locally, are described below.

The core.—Fine sticky clay is used in making the 'core'. The grit and stone pieces are either removed by sedimentation or are ground into powder in a stone mortar. The clay is then mixed with rice husk and arecanut fibre or pieces of old gunnies which serve as binding material and is well kneaded. This work is generally done by women and children. An approximate model of the intended articles is made of this prepared clay by hand and allowed to dry in the sun. When well dried, it is put in horizontal hand lathe and the desired shape is worked out. The outside is made smooth on the lathe by rubbing it with a polished flat end of some soft wood.

Waxing.—Moulding wax is prepared by melting together bee's wax, castor oil and resin (Kunthirikkam or kungilyam) in the proportion of 1: 1:2. The mixture hardens on cooling, and while still pliable, it is rolled into pencil-like sticks for convenient handling. About one pound of prepared wax is required for ten pounds of metal to make hollow-ware. The polished core is turned on the lathe and the prepared wax stick is gently applied to its surface. Due to the frictional heat, the wax melts and overlays itself on the core. The whole surface of the core, excepting the mouth portion, is thus covered with wax to the required thickness, i. e., a little thicker than the wall thickness of the article to be made, and it is then allowed to cool and harden. With a piece of hot iron the wax surface is again made smooth, even and uniform. The decorative lines, etc., are also worked in with the hot iron. The waxed model now resembles the intended article in every detail. The modelling being completed, the outer covering which forms the mould has to be put on. This is a liquid made of prepared clay sufficiently thin to find its way into every detail of the wax model, and is applied as evenly as possible by gently turning the model on the lathe. Several such coatings are applied so that, when dry, there is a thick outer coating and a solid inner core held together at the mouth with the wax model in-between. An opening, called '*Ānthrakkāl*' is provided in the outer shell for drawing the wax out by melting it and for filling the cavity with the molten metal.

The Outer Shell. The mould is covered by several layers of clay until the smith is satisfied that it is strong enough to withstand the pressure of the molten metal inside. It is dried in the sun after each coating, and after the last coating is applied, broken pieces of tiles and pots are stuck on the outside to give it extra strength. It is then heated to dull redness. The wax inside melts and is poured out through the clay jet (*Ānthrakkāl*). The mould

is now ready. For casting heavier and broader articles like cooking vessels, such as 'Vārpu' 'uruli', etc., the mould is made on a huge potter's wheel. Unlike in the case of smaller articles, the core is first made hollow and is subsequently filled with materials of all sorts.

Casting.—The metal is cut into small pieces and placed in a crucible or cauldron made of clay, which is generally ten to eighteen inches high and about eight to twelve inches in diameter with a hemispherical bottom; and the mouth of the crucible is covered with clay. The mould and the crucible are heated. Coconut-shell, charcoal and rice husk are generally used as fuel. The women-folk or children work the bellows. The smith knows by experience when the metal is ready for casting. When poured in the molten metal finds its way into the empty space previously occupied by the wax. The mould with its contents is covered and it lies buried for one or two days when it cools down slowly. When it has sufficiently cooled, the outer covering is carefully broken, the core is raked out as far as possible, the projecting metal rod formed in the jet is filed away and the object modelled in wax appears in bronze. At this stage it is brittle and requires annealing.

The article is heated to dull red in a furnace and suddenly immersed in luke-warm or hot water and is then taken out and allowed to cool. Costly articles, especially those that are very thin, are tempered in sesame oil. Considerable experience and skill are required for annealing; otherwise, the article may break when immersed in water or oil which is much colder than the red-hot metal. Care should also be taken to see that the oil does not catch fire.

After tempering, the article is put on the lathe and the out side is roughly polished with a steel chisel. The roughly polished surface is besmeared with a paste prepared by mixing 'Kāvi' earth and fine rice bran in laurel (*Calophyllum inophyllum*) oil and is polished again on the lathe,

first with hessian and then with soft cloth. The article is now ready for use. Large vessels, like 'vāṛpu' 'uṛuṭi' cooking pots, etc., are seldom polished.

Beating out plates and dishes:—Bronze of certain composition is malleable when hot, and this property is taken advantage of in beating out dinner plates, trays, etc. The metals in the required proportions, generally 30 per cent. copper and 20 per cent. tin are melted in the earthen crucibles and poured into small round pits. The round blocks thus obtained are taken out after cooling and examined if there are any air bubbles or any other defects. If there is any defect, the alloy is again melted and treated in a similar manner. Perfectly moulded discs are heated in a furnace of charcoal fire blown with bellows. When red hot, they are taken out and while one man dexterously turns it round and round with a pair of forceps, four others beat hard on it with heavy hammers as long as the discs remain red hot. They are again heated and beaten and this process is repeated until the required shape and size are obtained. The skill in bringing out the particular shape and dimensions depends upon the dexterity of the man who turns the disc. Generally eight men work in a batch; one man to melt and mould the metal into discs, one to work the bellows, another to turn the disc, four men for beating and one for polishing. The polishing is done either on the lathe or with the hand according to the nature of the article. Dinner plates are generally polished only on the inside. The outer surface is made rough to afford a good grip while handling.

Composition of alloys.—There is a series of alloys of copper and tin or zinc or both, which are commonly classed as bronze or brass, but some of them contain other metals also namely antimony, lead, silver, etc. In Travancore there are four varieties in use, classified according to their composition and commercial value, although slight alterations are made sometimes in the composition according to the requirements of the customers. In speaking of

bronze and brass, the proportion of the alloy is generally expressed in quantity of the tin or zinc utilised with ten parts of copper taken as a constant.

First quality.—This is locally known as “*Vellēḍu*.” The alloy contains two and a half to three parts tin and ten parts copper. This is generally used in casting household utensils like ‘*kindies*’ coffee pots, tumblers, etc. This alloy is more or less proof to weak acids such as those contained in butter-milk, tamarind, lime juice, etc.

Second quality.—This is only a sub-division of the first quality and the difference is in the manufacturing process. It is worked when red hot, i. e., in the malleable stage, for beating out plates, trays, etc. The composition is ten parts copper and two and a half parts tin. This is also proof to weak acids.

Third Quality.—This is generally mistaken for bronze and often goes by the common name ‘*Ōḍu*’, although in reality it is unmalleable brass (Picchaḷa). The alloy contains ten parts copper and five parts zinc and is not generally used in casting cooking vessels. Lamps, spittoons, images, locks, toys, betelnut-plates, trays, decorative articles, etc., are cast in this alloy. Sheet brass also could be beaten out at a particular temperature for manufacturing cooking pans which could be used only after the inside is tinned.

Fourth Quality.—The proportion of this alloy is ten of copper and two of tin. Common cooking vessels, frying pans, ladles, etc., which are of very large dimensions, such as *Vārpu*, ‘*Venkalappāna*’, etc., are cast in this alloy.

Bronze blocks and pieces of similar compositions are now imported from Europe. This material is locally known as ‘*Kappal ōḍu*’, meaning literally ‘shipped-bronze’, i. e., imported bronze, and is considerably cheaper. It is better liked by the smiths as it is ready made metal.

The economic prospects of the industry are not at all encouraging and this has been classified as one of the declining industries of the State,

Āranmuḷa Kaṇṇāḍi, is a unique example of bell-metal casting. Among the many curios in the world it deserves a high place. The foreign travellers who see it would be prepared to pay any price to procure one. The process of manufacturing the mirror is an art perhaps as wonderful as mummification in Egypt. Fortunately it has not become totally extinct, though it lingers on only as a curiosity having no commercial importance whatever. The *Āranmuḷa* mirror has gathered round it a tradition and sanctity, quite natural to works of art, but its ancient history is lost in obscurity. What information one has been able to gather from the old people now living at *Āranmuḷa* is given below.

The metal mirror is made of an alloy of copper and tin the proportions of which are kept secret by the only two surviving families at *Āranmuḷa* who know the process of making the mirror. The highest grade of bell metal vessel is an alloy of ten parts of copper and three or three and a quarter parts of tin. This is perhaps the maximum proportion of tin that can be used in casting domestic utensils, even by highly skilled workmen. The proportion of copper and tin in the *Āranmuḷa* mirror is ten to five and a quarter. An alloy of this composition is exceedingly brittle—even more brittle than glass of the same thickness, and, when polished, it has a surface as bright as that of a cut glass mirror.

The metal mirror is usually oval in shape, six inches by four inches and about one fifth of an inch thick. The face has to be perfectly plain and the greatest attention is, therefore, paid to the evenness and the perfectness of the plane of the mould.

The mould consists of two plates of the required shape of the finished mirror and is made of fine clay. The preparation of the plates requires great care and patience on the part of the workmen. Clay should be entirely free from grit, and should not crack when drying. The surfaces

of the plates should be very smooth. After two such plates are made with meticulous care and probably with incidental casualties from breakage, one plate is placed over the other with an oval ring of prepared wax, sandwiched between them along the edge.

The wax is made up of four ingredients in the following proportion :

Bee's wax	...	1 lb.
Resin	...	2 lbs.
Castor oil	...	4 ozs.
Coconut oil	...	4 ozs.

These are melted together and allowed to cool. The thickness of the wax ring is a little more than that of the required mirror, say by about one quarter of an inch. In this way an oval cavity is obtained between the two plates of clay. An opening is provided for the cavity by means of a clay jet called "Ānthrakkāl". The mould is then strengthened by putting on several layers of clay on the outside until the smith is satisfied that it will stand the high pressure and heat to which it will be subjected. The mould, with the coating clay will be about a foot and a half long and one foot thick. It is then heated and the wax ring inside is drained out completely. Now the mould has assumed its final form. The smith then places at the open end of the jet, "Ānthrakkāl" a crucible with an opening at the bottom which serves the purpose of both the crucible and the funnel.

Copper and tin of the required proportion are melted together in a crucible and the molten mass is slowly poured into a bamboo or wooden cylinder filled with rice bran. The hot liquid chars the bran as it passes through and solidifies into a rod. The impurities in the alloy disappear during the carbonisation of the bran. The rod is again melted and the process of purification repeated four or five times until the rod looks as bright as a glass filled with mercury.

The purified alloy is then broken up and put into the crucible attached to the mould and is covered with clay, and the mould is heated over a fire. Coconut shell and paddy husk are the fuel used, perhaps because the calorific value of these is higher than that of other fuels available in the locality. By about eight hours' continuous heating the alloy will melt completely and find its way into the inside of the mould. The smiths know by experience the time when the fire should be put out and then earth is thrown over the oven and the mould and the fire extinguished. In this condition the mould is left undisturbed for two or three days and allowed to cool. Afterwards it is taken out and the layers of burnt clay are removed carefully from the mirror plate.

Polishing.—The plate which, as has already been observed, is even more brittle than glass of the same thickness, has to be polished. The polish used consists of a paste made of rice bran and the oil extracted from the seed of laural (*Calophyllum inophyllum*) or maraveṭṭi (*Hydnocarpus Wightiana*). The greatest skill and the utmost patience are required in polishing the plate. It is by the process of polishing that the crude plate is converted into the mirror. Polishing is always done in one direction only, and never either in the opposite or any other direction. The mirror thus obtained is fixed on an artistically engraved brass frame with a mixture of lace and wax.

At one time ivory industry was in a prosperous condition. Now the industry is confined to the tempering

of imported steel and the manufacture of
 Iron Industries. sundry iron goods. The most difficult process in the manufacture of steel articles is that of tempering, by which different grades of hardness are obtained. The article to be tempered is heated in a furnace until it becomes red-hot. The degree to which it should be heated depends upon the nature of tempering required. Local

blacksmiths decide it from the glowing colour of the red hot article which they know by experience. When the article has been heated to the proper degree, it is taken out of the furnace with a pair of tongs and one end of it is dipped in cold water and kept there until the whole article is cooled down to the required degree. The smiths know this from the change in the colour of the steel. The whole article is then immersed in cold water suddenly and taken out immediately or after some time according to the nature of tempering required. Delicate and costly articles like thin sword blades are tempered by dipping the ends first in water and then immersing the whole article in thick oils, such as castor and sesame oils. Tempering the steel is a special art calling for great skill and practice on the part of the workmen. There still live a few smiths who have acquired the skill from their ancestors and are adepts in tempering even the finest of blades. There is a family of blacksmiths at Kāṭṭuvally in Māvēlikara taluk and another at Varkala who are able to make razors, scissors and surgical instruments which will compare favourably with the machine made articles imported from western countries.

The weaving of mats, cushions, etc., out of screw-pine leaves is one of the oldest cottage industries of the State and almost all varieties of these goods were once indispensable to an ordinary household in Travancore. Before the introduction of chairs, rugs, jamkāl, bags, and mattresses suitable substitutes made of the screw-pine leaves were meeting the local requirements, and even to-day these articles are being used to some extent in Travancore, Cochin and Malabar.

Screw-pine mat
weaving.

The screw-pine plant grows best in Central Travancore. There are three varieties, viz., the Āṅkaitha, the Peṅkaitha and the Pēkkaitha. The leaves of all these are used in the industry. The first step in the industry is the

plucking of the leaves and the removal of their thorns. After removing the thorns the leaves are rolled up like a tape and boiled in water. For making costly mats it is said that the leaves are boiled in milk to impart to them the necessary white colour and gloss. After boiling them they are dried in the sun, taking particular care that they are not over-dried lest they become brittle. The leaves are then dressed, i. e., splitted into narrow strips. The width of the strip will vary according to the fineness of the mat required. For ordinary mats the strips will be from one-eighth to one-tenth of an inch broad. The implement used in splitting the leaves is a bamboo splinter, about four inches long, shaped like a paper-cutter. For making very narrow strips for weaving fine mats, a small splitting frame is used. It is a rectangular frame two inches by one inch made of bamboo sticks with coir fibres across it, the space between two consecutive fibre being the same as the width of the strips required. Leaves are pulled through this frame, when the coir fibres cut them into small strips like a battery of circular saws cutting a plank into thin reapers. The dyed leaves are used only for making the borders of mats or for working in ornamental designs. Usually it is the pink colour that is used. The roots of the plant called "Chappangam" (*Caesalpinia Sappan*) and the tender leaves of another plant called "Kāśāvu" (*Medenilla edule*) are boiled together in water for about half an hour and then the prepared screw-pine leaves are immersed in it and again boiled for about one or two hours. The leaves will then have acquired an agreeable pink colour. The depth of the shade will depend upon the time taken for boiling. The leaves are then taken out and dried in the sun. After the introduction of aniline dyes, several other colours, such as green, blue, rose, etc., are also used.

Weaving Mats:—The only implement used by the weavers is what is locally called 'Poṭṭakkōlu'. This is a bamboo splinter about four inches long, shaped like a paper-

cutter, to straighten the longitudinal sides of the strip which curl up while drying. For weaving very fine mats the workers use their thumb nails. Fine bleached mats are woven diagonally. Two strips are straightened and held together under the toe of the weaver, and two others are then inserted crosswise interlacing the first two. Again, another strip is placed lengthwise and one more is inserted crosswise, interlacing the straight strip as in an ordinary weave. Thus a fresh strip is inserted lengthwise and crosswise alternately until the required dimensions are obtained. For weaving coarse mats, the unbleached leaves of *Ankaitha* are used. The weave is "plain". Several strips are placed in parallel lines and the cross strips are then inserted until one side of the long edge of the mat is completed. Weaving is continued until the required width is reached, and then the edges are bound by interlacing.

Edging:—The fine varieties of mats are made in two separate pieces; one is placed over the other and the two are edged together. The sides of the pieces are first cut evenly and then edged with thin strands of screw-pine leaves dyed red. Hats, belts, writing pads, cigarette cases, vanity boxes, marketing bags, etc., can be made out of screw-pine leaves.

Seasoning of light and soft woods is an ancient industry in Central Travancore. It is fast dying out. Boxes

made of soft woods are ordinarily used for carrying the theatrical equipment of pantomimic players. To improve the keeping quality and prevent insect attacks the wood, out of which the boxes are made, is seasoned by a special process. Boxes made of unseasoned wood will not last for more than a year or two; but if made of seasoned wood, they will last for several years. It is said that there are boxes more than a hundred years old, still in good condition. The process of seasoning, though simple, is ingenious. The gummy juice of the fruit

of *Diospyros embryopteris* is squeezed out and strained through a cloth, and a small quantity of copper sulphate is dissolved in it. The planks which have been previously sawn to the required thickness, usually a quarter to half an inch, are coated with this solution and dried in the sun. Generally two or three coatings are given and after each coating the planks are dried. Boxes are made of these planks in a rectangular shape with a convex top. Nails are not used in fastening the planks. Joints are dovetailed and made firm by the application of copper sulphate solution in the above-mentioned juice. The outside and inside of the box are then covered with specially prepared cloth. The juice of the same fruit is mixed with the bran of unboiled rice and made into a paste. Saffron or antimony sulphide is added to the paste to give it a yellow or red colour. The paste thus prepared is smeared on a piece of cambric cloth and with it the box is fitted with hinges, corner plates and lock, all made of copper or brass, but never of iron. The box is now ready for use.

Boxes of this kind are not much in demand at present, firstly because cheap steel trunks are floating the market, and secondly because local carpenters do not change the old stereo-typed pattern and make boxes of the shape and size suited to modern tastes and requirements.

Before the introduction of umbrellas from the west the local demand used to be met entirely by indigenous palm-leaf umbrellas. Even to-day only these umbrellas are being used in religious processions in which members of the royal family take part; gosha women of the Nampathiri and other communities use them as a sort of purdah when they go out of their houses, and in country parts many people, particularly the farmers and field-labourers, use them ordinarily. Different types of umbrellas are made for different purposes. Those used by the labourers have no handles, but are only

Palm-leaf umbrella-
making.

provided with caps at the centre of the inside so that they can be placed on the head. They look like Siamese hats. The type of umbrella commonly used has a handle three to four feet long. The umbrellas used in temples have handles, about ten to fifteen feet in length, so that they may be held over the idol placed on elephant's back when taken in procession. A rare type is the one used by gosha women. It is very broad, about five to six feet in diameter, and is provided with a short handle.

The process of making these umbrellas is quite simple. It is a speciality of a class of people called Kaniyāns who are also the indigenous astrologers and physicians. The handle is made of a straight hard bamboo stick. Holes are made round the thicker end of the stick and the mid ribs of the sago-palm leaves, after they have been cleaned, dried and polished, are inserted radially into these holes and are kept in position by tying them to a ring made of the same mid ribs. This is the frame-work of the umbrella. The fan-like leaves of the sago-palm are prepared by removing the stalk and mid ribs and by clipping off the tapering ends. They are dried in the sun and soaked in water just before they are required for use, to make them pliable. The frame work is covered by two or more layers of these prepared leaves and they are fastened to it by pins made of the mid ribs of the same palm leaf. The umbrella is then dried in the sun until it assumes a light khaki colour.

Palm-leaf umbrellas are going out of fashion because of the inconvenience in handling them. They could not be folded like the umbrellas made of cloth and the local industry is, therefore, dying out. It could, however, be revived if new uses could be found for them. Recently the traffic constables on duty at road junctions in the town of Trivandrum have been supplied with these umbrellas of a fairly large size, mounted on stands, so that they can stand under them, protected from the sun and the rain.

Jaggery is an article of local consumption. Coconut Jaggery is the unrefined sugar manufacture from the sweet juice drawn from the flower shoot of the coconut palm. It is usually sold in cakes, resembling a segment of a sphere and weighing ordinarily about two ounces each. The manufacture of coconut jaggery is now confined to three localities in Travancore, namely Tanni (near Paṭavūr) in Quilon taluk, Eḷukōṇe in Kōṭṭarakara taluk and Parūr in North Travancore. There are altogether only about fifty families engaged in this industry at present.

The main uses of coconut jaggery are for making sweets and for condimenting tobacco. On a limited scale it is still largely in demand in the neighbourhood of the localities where it is made, chiefly by the Muslims for preparing sweets for their festivals. There was a time when molasses (Śarkaṛa) prepared from sugarcane in North Travancore, coconut jaggery made in South Travancore, were universally used by the people of this country instead of refined sugar.

Processes of manufacture:—The manufacture of jaggery used to be entirely in the hands of the Īlavas who from time immemorial have been intimately connected with the growing of the coconut palms as well as industries connected with its produce. There are three processes in the manufacture of coconut jaggery, namely, tapping and drawing of sweet toddy from the palm, boiling of the sweet toddy, and moulding of jaggery cakes. Each of these is an art in itself, though the latter two are comparatively simple. These processes are kept more or less as family secrets.

Tapping.—It is not possible to say with any degree of definiteness when tapping for toddy was introduced here. It is at least as old as the drink habit of the people. The Īlavas are the class of people who have been carrying on this profession from very early times. Tapping is a

some-what complicated process requiring great skill and practice on the part of the tapper. The time for tapping is when the flower shoot of the coconut palm is tender. At this stage the sheath is gently tapped in the morning, noon and evening for four to six days from top to bottom in a spiral direction, and never in the reverse direction. Special care is taken not to reduce the flower-buds inside the sheath to a pulpy condition, in which case the shoot becomes useless.

In the process of tapping, the thickly packed buds inside the sheath get loosened, a certain amount of heat is generated and the flow of the juice is stimulated. After tapping for five to ten minutes, according to the size of the shoot, it is tied up at three or four places by the leaflets of the coconut frond, to prevent the sheath from bursting open, either due to the pressure of the juice inside or the heat of the sun. After four or five days the tip of the shoot is cut flat and besmeared with prepared clay. In two to five days more, the toddy begins to ooze out. The tapper knows the appropriate time, but the appearance of bees, gnats, and flies hovering round the cut portion of the shoot and the sour smell of the alcohol are the surest indications of the exudation of toddy. The tapper then places an earthen pot on the shoot and provides a duct made of the leaflet of the coconut frond for the flow of the juice into the pot. Even after the juice has begun to ooze out, the shoot has to be cut afresh very morning, noon and evening and smeared with fresh clay which not only assists the capillary action and draws up the toddy, but also prevents the shoot from drying up.

The implements required for tapping are :

1. A tapping bone.
2. A tapper's knife.
3. Two brushes.
4. A bamboo tube containing powdered rock for sharpening the knife.

5. An earthen pot to gather the toddy from the shoot.
6. Another light vessel made of the leaf-sheath of the areca-palm or any other light material to collect the toddy as the tapper moves from tree to tree.

The tapping bone is about twelve to sixteen inches in length and about two inches in diameter. It is usually the fore-arm bone of either the bison or the sambur that is used. In exceptionally rare cases, sticks of hard and heavy wood, such as the heart-wood of tamarind or ebony tree, are also used. Traders in touch with the hill districts bring the bones from the forest and sell them to the tappers. They are first cleaned and cured, and the cleaned marrow hole is filled with an oil, the preparation of which is specially known only to a few people even among the tappers. A unit of oil contains 4 ozs. of cow's ghee, 1 oz. of pig's fat, $\frac{1}{4}$ oz. of peacock's fat and 1 oz. of coconut oil prepared by the boiling process. This mixture is boiled over a slow fire till it turns brown, "the colour of the cobra's eye", to put it in the tapper's language. Much superstitious veneration is attached to this oil and it is still regarded as a sacred thing. The object of filling such a heavy oil in the bone appears to be to improve its keeping quality and to produce a lubricating effect in the course of tapping, when tiny particles of the oil may ooze out through the pores of the bone. In the case of wooden tapping sticks, holes are bored in the centre and filled with oil. Whatever may be the scientific effect of the oil on the tapping, it is a firm conviction of the tappers that without it toddy could not be drawn out fully and the flower shoot would wither up. Once a month the oil in the bone is changed.

The tapper's knife which resembles the butcher's chopping knife in shape, is about six inches long and four inches broad and has a short handle. The blade is made of tempered steel and is very sharp. It is with this knife that

the flower shoot is cut. As only a tiny portion of the shoot (about two m. m. thick) has to be sliced off every time, the knife must be very sharp. It must be sharpened after every time it is used and for this purpose the tapper carries with him some rock powder. The stalk of the coconut frond is his whetting stone and he does the sharpening when he is at the top of the tree just before he begins his operations.

Clay for smearing on the cut surface is prepared by grinding it and sometimes even by sedimenting it to remove all grit. Great care is taken to keep it wet always. The tapper carries a small quantity of it in a clean coconut shell which forms part of his kit.

Brushes are made of the stalks of the coconut frond. Two of them are generally required, one for smearing the clay on the shoot and the other for smearing the lime in the pot in which the toddy is collected. The object of smearing lime is to prevent the fermentation of the juice.

Boiling and moulding. After the toddy is drawn it is boiled and allowed to cool, when all the suspended particles settle down. The clear liquid is decanted into another vessel and the sediment is thrown away. In this condition the liquid is non-intoxicating and is an excellent beverage, sweet and pleasant smelling, known locally as "Akkāni." It is from this liquid that jaggery is manufactured. For this purpose it is further boiled in large earthen pots over a slow fire, until the liquid becomes viscous, something like honey. At this stage it is known as "Pāni" and is used for preparing sweets, pudding, etc. Pāni is a delicacy especially at Syrian Christian feasts.

The Pāni is further boiled down until it assumes the form of treacle, and then it is poured into small moulds made of coconut shell. The time when the substance is ripe for moulding is best known to the housewives who prepare the jaggery. If too early, it will not form a mould, and if too late, it will become too hard. The arrangement for moulding the cake is very simple, though primitive, but is

singularly natural and practical. The upper half of the coconut shell which contains the "eye" through which the embryo sprouts is used for making the mould. The 'eye' is bored through and temporarily closed with dry leaves. The treacle-like jaggery is poured into the shell and, when it has cooled and solidified, it is pushed out by expressing it through the hole.

The palmyra sugarcandy is the brown crystallised sugar of the sweet juice of the flower shoot of the palmyra palm, much in demand for preparing sweet foods for children and Āyurvēdic drugs. It is generally believed that it has none of the defects of refined cane or beet-root sugar and that, on the other hand, it has exceptional cooling properties. It is largely used in the diet of small-pox patients. The manufacture of sugarcandy, locally known as "Panakalkandū" was once a flourishing industry in South Travancore, especially in Agasthīswaram and Rājākkamangalam, but is now practically extinct. It is still being carried on in the adjoining Tinnevely district, and Travancore obtains its supplies from there.

Sugarcandy is manufactured from the sweet toddy of the palmyra palm. The process of the extraction of toddy is slightly different from that of the coconut palm and the juice has to be squeezed out of it by wooden clamps. In all other respects the method of extracting sweet toddy from the palmyra palm and the coconut palm is practically the same.

Tapping.—Three kinds of clamps or squeezers are generally used. The smallest of these is used first and then either of the two. The knife used in slicing off the flower shoot resembles the pruning knife with a curved beak.

Toddy is first boiled, and when it reaches a certain stage, it becomes a thick viscous liquid. This is called 'Padini'. The sugar in the sweet toddy or in the padini is

not crystallisable. The stage at which boiled sweet toddy will form crystals is when it obtains the viscosity of the ordinary syrup. Then it is poured into new earthen pots, and an indigenous plant known by the name of Śivanār Koṛanḍi (*Indigoera aspalathoides*) is placed in the liquid to serve as a nucleus for the formation of crystals. It is interesting to note that, without putting this shrub into the liquid, the crystals will not be formed, however long it may be kept. The plant also prevents the fermentation of the liquid. It is remarkable that the people, though uneducated in the modern sense, knew the principle of crystallization. Generally, the manufacturers whose dwellings are only small huts with no storage room or cellar bury the pots with their contents in the ground for keeping them undisturbed. In the course of five to six months crystals will be formed round the plant. They are then shaken down, gathered, washed in sweet toddy, dried in the sun, and packed in earthen pots.

For the encouragement of the woollen industry a small flock of sheep was attached to the silk farm in Trivandrum with a view to develop the blanket industry and introduce rug making and carpet weaving. A man was sent to Vellore and Koilkundala for training. On his return a school was opened where training in the above industries was imparted. Pupils were supplied with looms and fleece so that they might carry on the industry in their homes. The blankets they made were taken over by the Agricultural Department and the proceeds credited to the price of fleece advanced.

There are 24,524 people engaged in the industries of basket making, cane working and other allied industries. The basket making industry engages more women than men. A Bamboo Depot was opened by Government at Alwaye in 1095 to improve the industry and to find out new markets. The Industries Department introduced new patterns and

designs with the result that bamboo mats, brief bags, waste paper baskets, trays, portmanteaux, suit cases, tiffin carriers, flower baskets, etc., came to be manufactured and these products found a good market in Europe. Other industries which are pursued by the people are cabinet making, carpentry, leather works, soap making, ivory carving, fruit canning, chank button manufacture, rice husking, etc.

BIBLIOGRAPHY

- | | |
|---|---|
| Almis, M. A. | Report on the coir yarn industry in Travancore. |
| Anderson, W. T. | Note on coir industry. |
| Barker, S. G. | Industrial Survey of Travancore. |
| Clow, A. G. | The State and Industry. |
| Cunningham, W. | The Growth of English Industry and Commerce. |
| Das, C. K. | Report on the Oils of Travancore. |
| Delisle Burns | Industry and Civilisation. |
| Jather and Berry | Indian Economics. |
| Kunjan Pillai, N., Dr. | Census Report, 1931. |
| Mādhavan, C. O. | The Salt Industry of Travancore. |
| Masillamoni, E. | Minerals and Mineral Industry in Travancore. |
| Pinchess, H. L. | Note on Tea. |
| Commercial Review. | 1935, 1936 and 1937 Volumes. |
| Economic Development Board, Proceedings. | |
| Government of Travancore Administration Reports from 1096 to 1111. | |
| Government of Travancore Statistics Vols. I to XVIII. | |
| Government of Travancore Banking Enquiry Committee's Report. | |
| Government of Travancore Economic Depression Enquiry Committee's Report. | |
| Government of Travancore Regulations and Proclamations. | |
| Government of Travancore Administration Reports of the Department of Industries, from 1096 to 1111. | |
| Government of Travancore Bulletins published by the Department of Industries. | |

CHAPTER XXIII

TRADE AND COMMERCE

Travancore has all the natural advantages necessary for the development of commerce. It has a long uninterrupted coastline with several ports. The

General.

backwaters form a cheap line of communication. There are many rivers and canals in which boats can ply throughout the year. Nearly 45 per cent. of the trade of Travancore is carried through the backwaters and canals. Connecting these internal waterways and ports there are many arterial roads throughout the length and breadth of the State, to which is linked a net-work of subsidiary and feeder roads. Roads have also been constructed so as to open up and serve important planting areas and industrial centres. Most of these roads are eminently suited for motor traffic. Branches of the South Indian Railway run from Angamāle to Eḍappally in the north, and from Shenkōṭṭa to Trivandrum, directing rail-borne trade to the harbours of Cochin and Trivandrum respectively. These advantages have facilitated the internal and external trade of the country to a large extent.

Travancore has had dealings with foreign nations from the remotest period, and pepper, cassia, arecanut, etc., were bartered for Chinese, Arabian and Roman goods. The Greeks, the Egyptians and the Romans among the ancient peoples, the Danes, the Portuguese, the Dutch, the French and the English were the nations with whom Travancore had commercial relations. Even in the early days of the Roman Empire Travancore exported pepper, cardamom and ginger to Rome. The Danes were permitted to erect a factory at Eḍavā for purposes of trade. During a period of 150 years of Portuguese relations with Malabar, the trade

of Travancore developed to a considerable extent. The Portuguese relationship created a world market for Travancore products. The direct exportation of pepper, cardamom, ginger and other Malabar produce to Europe created a great demand for them. The trade which before this time was mainly in the hands of a few big merchants became the business of the people at large. It was from this period that coconut began to be grown for purposes of trade. Coir also became an important article of trade. Orta says of coir in his Colloquies :—"Of it they make the riggings and cordage for all ships. It is very serviceable for us. It is very flexible and does not rot in salt water. All the ships are caulked with it so that it serves as linen, as oakum and as matting. These qualities make it good merchandise for Portugal".

With the advent of the Portuguese the historic commercial connection between Malabar, Arabia and Egypt gradually came to an end. In its place a new European trade grew up which brought more money and luxury into the country. The trade became more widespread and the resulting prosperity was also not confined to ports or small communities, but to the whole people.

But the commercial relations with the Portuguese soon gave way to the Dutch. The Dutch desired to establish by contract with Indian rulers a monopoly over the goods they wanted to buy. But this did not work well. The Dutch monopoly of pepper trade in Malabar broke down with the conquest of the petty chieftainships up to Cochin by Mārṭhāṇḍa Varma. The Travancore Rāja was bound by treaty to sell to the Dutch 1,50,000 lbs. of pepper at Rs. 65 per candy of 500 lbs. from his hereditary possessions and 1,00,000 lbs. from his newly acquired territories, at Rs. 55. As the English paid the Rāja Rs. 80 per candy and the Danes at Coḷachel still higher rates, he never supplied the Dutch with the full quantities stipulated. In fact the Dutch Company got only whatever was left, and

in times of drought, etc., it got little. The inability of the Dutch to enforce their monopoly made the pepper trade general. The Dutch lost heavily in consequence. The pepper trade escaped from the monopoly stage and spread among the several European nations who vied with one another for the trade of the Indian Coast.

Next to pepper, the most important trade in South Travancore was in cotton cloth. The fine cloth made at Irāṇiel and Kōṭṭār has been famous for many centuries. The Portuguese carried on a very flourishing trade in it. When the Dutch Company expelled the Portuguese from the coast, Captain Neilhoff who was the chief at Quilon observed that Kōṭṭār was the centre of great traffic. The Company bought the piece goods from the traders through their agents. An effort was also made to establish chintz dye wash under the protection of the Company. Kōṭṭār piece goods continued to be a large and important item of trade. The Dutch traded also in cardamom and indigo. The import trade consisted of opium, sugar, coffee, Chinese silk, Japanese copra, arms and ammunition.

The association of Travancore State with the English began in the middle of the 17th century. Hamilton, an early English traveller, refers to the English factories of Rutteri (Viṭṭūr) and Brinjan (Villajaniyam), both to the south of Anjengo, as having been already founded. In the year 1684, the English East India Company obtained from the Rāṇi of Ātingal a sandy spit of land at Anjengo on the sea coast, about 20 miles north of Trivandrum, with a view to erect a factory. This was the first commercial and political relation between Travancore and the English East India Company. The English always received warm support in all their subsequent undertakings in Travancore.

Side by side with the development of external trade the Mahārājas of Travancore took particular care to so shape the administration of the country as to develop internal trade. During the time of His Highness Mahārāja

Mārthāṇḍa Varma a Commercial Department for the development of trade was organised, an excise system was introduced, and a consolidated statement regulating expenditure by the revenue was prepared for the first time. Warehouses or commercial stores were established at Padmanābhapuram, Trivandrum, Quilon. Māvēlikaṛa and Arakkula. These were designated paṇḍakaśālas or thorums. Each of these houses was superintended by an officer called Vichārippukāraṇ or thorakkāraṇ and guarded by a contingent of the State Army. Pepper, tobacco, cassia, arecanut and other articles of commerce were purchased and stored in these depots on account of the Sirkar at fixed rates of price which were then introduced and established throughout Travancore by Royal Proclamation. The Government exercised rights of monopoly over these articles. They were sold by the Sirkar to merchants both wholesale and in retail. Rules were framed and established for the guidance of the Commercial Department and Royal Proclamations were issued legalising the monopoly of all such articles by the Sirkar and prohibiting private dealing in them. A scheme for levying duties on articles of commerce was introduced and a number of inland and frontier chowkeys were established at several convenient places in order to check the goods transmitted from place to place and to levy on them the duty prescribed by the Government.

In the succeeding reign, i. e., during the time of the Dharma Rāja, steps were taken to improve all the sea ports of Travancore for the purpose of increasing traffic. The port of Coḷachel was improved. A large warehouse, a store godown and a spacious bungalow were built at Pūnthura and a port was established there. After the opening of this port Dewan Kēśava Piḷḷai ordered a survey of the sea at Alleppey by some experienced persons, and, finding the existence of a good anchorage protected by mud bank, arranged for opening a port there also. A warehouse and a few shops were built at Sirkar expense and merchants were invited from various

places to establish themselves at the new port. The Dewan communicated with his friends in Bombay and induced a couple of rich and influential Cutch and Sindh merchants to come and settle down at the new port. Brahman cloth merchants from Tinnevely and other commercial towns established themselves at Alleppey. A Vichārippukāran was appointed and all the goods brought to Alleppey had to be stored under the supervision of the Vichārippukāran. Ships were built for conveying the staple produce of the country to Bombay and Calcutta and the Sirkar embarked in trade and commercial speculation. Several canals were opened to facilitate and extend communications from the backwater to the new town of Alleppey. Vichārippukārāns were also posted at Kumbham, Gūḍalūr and other places to collect hill produces, such as cardamom, bee's wax, honey, ivory, stick-lac, etc., and consign them to Alleppey. In 970 M. E. (1795. A. D.) a new treaty was concluded with the English East India Company, which included a clause of commercial significance, namely, a contract for the supply of pepper for the Company's investments.

Monopolies were multiplied till almost all important articles were engrossed by the system. Pepper, cardamom, ginger, cinnamon, arecanuts, turmeric, salt, copra, coir, tobacco, cotton, teak, blackwood and numerous other staples were bought and sold by the Sirkar with a view to benefit the public revenues. The trammels placed on the trade of the country by means of monopolies and transit duties might have proved fatal to commercial prosperity had it not been that this evil was considerably compensated for by the extreme lightness of the land tax which greatly favoured protection.

The bold and fruitful policy begun by Rājā Kēśava Dās was pursued with considerable advantage by his illustrious successor Velu Thampy Paḷawa. Commercial speculations and pursuits engaged his special attention. The Commercial Department of the Sirkar was better

organised. He took great interest in improving Quilon, where new bazaars were built. Several Tinnevely and Madura merchants were invited to settle down there. He devoted a good deal of attention to the improvement of the town and port of Alleppey, established a market at Changanāssēry and another at Thalayōlapparampu. In these two thoroughfares weekly and bi-weekly marts were held, when all the articles produced in the interior of the country were brought and disposed of. From there they found their way to the ports of Alleppey and Cochin. The road from Quilon to Shenkōṭṭa was opened. Trade continued to receive encouragement ever after. Col. Munro, the Dewan-Resident, constructed salt stores and bankshalls on better principles and regulated the collection of customs by establishing additional chowkeys throughout the country. In 991 M. E., Rāṇi Gauri Pārvathi Bāyi appointed a European as the Sirkar Commercial Agent at Alleppey for the better administration of trade. His Highness Swāthi Thirunāl Mahārāja sanctioned in 1011 the abolition of duty on 165 articles of different descriptions on which inland as well as export or import duties had been levied. Pepper was collected from the ryots by the Sirkar at the Commercial Depot at Alleppey and sold under the auspices of the Sirkar Agent in 1025.

Bengal paddy and rice were imported into Travancore through the Sirkar's Commercial Agent for the first time in 1028. By 1030 the rate of the duty levied on exports was fixed at 5 per cent. and on imports at 8 per cent. on the tariff valuation of the goods. Any article once shipped after paying duty but landed again in any other port of the Sirkar owing to stress of weather was formerly subject to a further levy of half the duty on re-shipment. But in the year 1030 orders were issued discontinuing the demand of any duty a second time on such articles, although the measure entailed some loss on the Sirkar. The duty on exports and

imports derived in 1033 at the above percentage was Rs. 1,18,719 and Rs. 91,406 respectively.

The trade of Travancore steadily increased during the next few years. The State realised Rs. 2,19,000 by way of customs revenue annually. The total tariff value of exports amounted to nearly Rs. 18 lakhs and that of imports to Rs. 12 lakhs. But the tariff value was much below the market value and the estimates did not include the exports and imports of goods constituting Sirkar monopoly, viz., timber, cardamom, pepper, salt, tobacco, etc. Making allowance for these and including the value of goods imported duty free, the actual annual value of exports was estimated at upwards of Rs. 33 lakhs and that of imports above Rs. 22 lakhs.

The year 1036 was important in the development of Travancore trade in more than one way. The monopoly on pepper was abolished and an export duty substituted. A revision of the export tariff values had been framed and consequently it failed to bear any correspondence with existing market values. In many respects the values were assimilated to those of the British Indian tariff, while in some cases, where local peculiarities rendered it necessary, some judicious discriminations were made. The new export tariff was brought into force on the 31st Āni 1036/13th July 1861.

The reduction made in the monopoly selling prices of tobacco made it necessary to enhance the rates of duty on exports and imports from 5 to 6, 8 to 10 and 10 to 12 per cent. respectively. Towards the close of the year 1037 the selling price of tobacco was considerably reduced. An important change was effected that year in the mode of selling tobacco. It was sold to all merchants of respectability instead of to a few in each district as before.

Meanwhile, Sir T. Mādhava Rao, Dewan of Travancore, had entered into correspondence with the Madras

Government regarding the trade difficulties which Travancore had to encounter in the operation of the British Indian Trade Act of 1848 which freed coasting trade from all customs duties on goods passing from one port to another within British India. Indian States were excluded from the benefits of this Act. Consequently Travancore suffered a good deal in the development of its trade. Exports from and imports to Travancore had to pay foreign duty at British ports and this duty had been heavy for some years. But Travancore had free access by land to the ports of British Cochin; only the Cochin Sirkar intercepted and levied a duty of its own on those goods in transit. The Cochin Sirkar's duty, however, was much less than the foreign duty of the British Government. The consequence was that it was found to be more advantageous to take Travancore goods by land to British Cochin and thence transport them to other parts of British India under the freedom granted by the Interportal Act than to export them from Travancore ports direct by sea to British Indian ports. The same was the case with imports. A merchant found it more advantageous to take the goods destined for Travancore to British Cochin in the first place, whither he could take them free of British duty under the Interportal Act, and thence by land to their destination than to export them direct from a British Indian port to a Travancore port. This had the effect of paralysing the trade of the ports of Travancore, especially Alleppey, and was not in any way advantageous to the British Indian Government, as the deviation of trade only helped the Cochin Government to fill its coffers at the expense of Travancore. A commercial treaty between the two Governments was under consideration since 1038, which progressed in 1039, matured and came into force in 1040. This treaty is known under the name of the Interportal Trade Convention. Agreeably to the Convention the following notification was issued by His Highness the Mahārāja of Travancore in acceptance of the treaty.

1. "Whereas it has been found expedient to revise, in communication with the British Indian Government and the Cochin Sirkar, the system of duties hitherto levied on the trade of Travancore, it is notified that from and after 1st of June 1865/20th Vaikāśy 1040 no customs duties or account of this Sirkar will be levied on goods imported by land, sea or backwater into Travancore, and being the produce and manufacture of British India or of the territories of the Cochin State excepting on tobacco, raw and manufactured, salt, opium, spirits, which will be treated as heretofore.

2. "The British Indian and Cochin Governments will also give up their customs duties on all goods imported by land, sea, or backwater, into Travancore from their territories. The British Indian Government will permit Bombay salt to be exported to Travancore on the same terms as to the British Provinces, such as Malabar and Canara.

3. "On imported goods other than those which are the produce or manufacture of British India, or territories of the Cochin State, the Travancore Government will levy the British Indian rates of duty, except when they shall have already paid duty to British India or Cochin State, in which case they will be exempted from duty.

4. "The duty that this Government will levy on goods exported from Travancore will be 10 per cent. on timber, Rs. 15 per candy of 500 English lbs. on pepper and betel-nut, and 5 per cent. on all other goods. But Tinnevely cloths exported from Travancore to British India or to Sirkar Cochin will be free. And also only a limited number of commodities will be liable to export duty at the Chowkies of Rāmāswaramkōṭṭa, Bhagavathikkōṭṭa and Edappally, the said commodities being notified from time to time.

5. "Neither the British Indian Government nor the Cochin State will levy any duty on goods imported into

their territories from Travancore, whether by land, sea or backwater, and whether the produce and manufacture of Travancore or foreign goods, which have already paid import duty to this State, excepting salt, opium, spirits.

6. "The Sirkar will not tax Coimbatore or other British Indian produce passing through the Travancore backwater to British Cochin, or to the Cochin State, not tax the produce of the territories of the Cochin Sirkar, directly proceeding through Travancore to British Cochin or to some other part of the territories of the Cochin State itself.

7. "The British Indian Tariff valuations will supersede the Tariffs hitherto in force in the Chowkies of this Sirkar".

The British Government in their turn published the following notification dated the 23rd May 1865 in agreement of the terms:—

1. "It is hereby notified, for general information, that the following arrangements have been made between the British Government and the Native States of Cochin and Travancore for the removal of fiscal restrictions on trade between British India and those States, and that effect has been given to the same under the sanction of the Government of India.

2. "No duties will hereafter be levied, whether by the British Government or the Travancore and Cochin States, on goods, being the produce or manufacture of British India, on their import, whether by sea or by land, through the Cochin and Travancore territories, excepting tobacco, salt, opium, and spirits.

3. "No duty will hereafter be levied by the British Government on goods, the produce or the manufacture of the Cochin and Travancore States, on their import into British Indian territory, whether by sea or by land, excepting salt, opium, and spirits.

4. "Free import will be allowed by the Cochin State into its territories of Travancore produce and manufactures

and *vice versa*, on the same terms and with the same exceptions as those arranged with the British Government.

5. "The Cochin and Travancore States will adopt the British Indian Tariff and rates of import duty on all *foreign* goods imported into them, tobacco being excepted or import into Travancore.

6. "Foreign goods which have already paid duty on import to British India, or to either the Cochin or Travancore State, will be allowed to pass free on further transport to any of these territories.

7. "The Cochin State will adopt the British Indian rates of export duty on articles exported to foreign countries pepper being excepted and charged at Rs. 15 a candy.

8. "The Travancore State will continue for the present to levy export duties not less than those obtaining in British India but not more than 5 per cent. on all ordinary exports, 10 per cent. on timber and Rs. 15 a candy on pepper and betel-nut *ad valorem*.

9. "The export duty at the Travancore inland Chowkies, viz., those not situated on the backwater, will be confined to principal goods only, which will be notified from time to time.

10. "The British Indian goods passing from Coimbatore through Travancore to the Cochin territories or British Cochin will be exempt from export duties in Travancore. The same exemption will extend to Tinnevely cloths passing through Travancore.

11. "Goods passing from one part of the Cochin State through Travancore territory to any other part of the ormer will be exempt from export duty in Travancore.

12. "The Travancore and Cochin States will adopt the British Indian Tariff valuations for exports as well as imports.

13. "The Cochin and Travancore States will adopt the British Indian selling price of salt, the rates at inland

depots being raised so as to place the salt of Cochin, Travancore and British India on the same footing in the market.

14. "The Cochin and Travancore States will import British Indian salt on the same terms on which it is imported into the British Indian Ports.

15. "The Travancore State will levy import duty on tobacco at rates not exceeding the following :—

On Coimbatore tobacco Rs. 40 a candy.

„ Tinnevelly	„	„	85	do.
„ (Kalamāny)	„	„	120	do.
„ Jaffna	„	„	120	do."

A modest computation indicated a loss of Rs. 1,16,500 to the Cochin Sirkar on account of customs revenue, and this loss the British Government agreed to make good. In regard to Travancore, a stipulation was made that the British Government should compensate to the maximum of Rs. 40,000 on account of customs revenue on goods landed at British Indian ports for consumption in Travancore. This figure was arrived at by the average for a few years of customs duty on foreign goods imported both by land and sea. The average receipts thus calculated amounted to Rs. 53,218 of which Rs. 13,218 formed the duty on goods imported direct by sea. The British Government maintained that for every increase over Rs. 13,218 on account of duty directly received in the sea customs houses of Travancore a corresponding reduction should be made from the compensation of Rs. 40,000 agreed upon. The Travancore Government yielded to the stipulation.

In consideration of the surrender by Travancore of her right to levy import duties on foreign goods entering Travancore after having paid duty in British India, the British Government agreed to compensate her to the extent of the probable loss sustained by her on this account. The average amount of customs collected at the time of the Interportal Convention was B. Rs. 53,218 of which

B. Rs. 13,218 represented the amount of import duty realised at Travancore seaports, and the loss then sustained by the State on account of the Convention was Rs. 40,000. Although the principle was recognised that Travancore was entitled to be compensated to the extent of the probable loss sustained by her on account of the surrender of the right to levy duty on goods which have already paid duty in British India or Cochin, the practice has been to calculate such loss on the basis of the figures for 1863-64. Thus, when the Travancore sea customs collections (on imports from foreign countries, excluding goods imported by sea for the use of the Travancore Government) are less than B. Rs. 13,218, the British Government pays to Travancore B. Rs. 40,000; but if in any year the collections exceed B. Rs. 13,218, the excess amount realised is deducted from the sum of B. Rs. 40,000 and the balance is paid to Travancore. Tobacco, salt, opium and spirits are excluded from the Convention. The assigned values, the rates of values and the rates of duty adopted by Travancore in regard to imports from foreign countries follow the British Indian Tariff.

In regard to exports, the State is free to levy duty on any commodity. Under the Interportal Trade Convention, however, the rate of duty on tariff valuation shall not exceed Rs. 5 per cent. on all ordinary exports, Rs. 10 per cent. on timber and Rs. 15 per candy on pepper and arecanut. Of the articles on which export duty is now levied, the most important are copra, coir, pepper, dry ginger, jaggery, salt fish, arecanuts and tamarind.

The articles of monopoly, viz., salt, tobacco, pepper and opium, were exempted from the Convention. Pepper and tobacco were formerly monopolies. The pepper monopoly was abolished in 1036 and superseded first by an excise duty of Rs. 15 per candy, levied in the taluks before the article left, and afterwards in 1044 by an export duty of Rs. 5 per candy. Tobacco which was also a very strict

monopoly was all imported by the Government from British India and Ceylon and sold in the Sirkar's own bankshalls. This system was abolished in 1038 and superseded by an import duty which had been successively reduced.

The history of the trade of Travancore since the date of the Interportal Trade Convention is only the record of a series of revisions of tariffs in line with those of British India.

Statement showing the revenue derived from customs from 1101-1110.

Year.	Land Customs	Sea Customs	Compensation under Interportal Convention	Amount received under Cochín Harbour Agreement	Duty on tea	Miscellaneous	Total	Customs duty on matches	Grand total	Deduct refunds	Net total revenue.
1101	14,49,731	11,67,895	"	"	3,92,287	13,824	"	"	30,23,737	1,52,300	28,71,437
1102	15,33,500	13,29,150	985	"	3,78,255	13,571	"	"	32,55,461	2,33,957	30,21,504
1103	15,39,616	11,43,790	"	"	4,85,381	13,598	"	"	31,84,385	28,807	31,55,578
1104	14,93,074	12,83,156	"	"	4,60,689	16,583	"	"	32,53,502	2,322	32,51,180
1105	17,21,079	13,20,475	"	"	4,39,159	16,397	"	"	34,97,110	1,351	34,95,759
1106	16,08,780	14,54,199	"	"	4,19,778	14,682	"	"	34,96,439	2,375	34,95,064
1107	13,39,444	9,59,912	"	"	4,83,634	13,189	"	"	27,96,179	2,488	27,93,691
1108	13,60,654	12,41,671	"	12,94,430	4,53,076	13,522	"	"	43,63,353	3,124	43,60,229
1109	15,97,088	11,06,467	"	9,09,100	4,40,342	15,487	40,68,484	611	40,69,095	479	40,68,616
1110	15,03,989	8,19,362	"	11,38,955	4,50,767	15,738	39,28,811	3,22,289	42,51,100	2,951	42,48,149

As must have been observed from the foregoing paragraphs, an important characteristic of the early trade of

Travancore was the right of monopoly the
• Monopolies:— State exercised over several of its products.

The rulers of Travancore owed the idea of monopoly to the Dutch East India Company who, impelled by their anxiety to remain masters of the pepper trade in Malabar, introduced the system of monopoly into the country. De Jong, Commandant of Cochin in 1757, in his Memorial points out that monopolies in pepper did not exist before the advent of the Dutch and were "illegal combinations of rulers, for defrauding the people." "The Portuguese," says he, "obtained it from the Rajas, who acted only as brokers between the owners and the Portuguese Government. When competition between the European nations arose in the pepper trade, monopolies were by degrees introduced, but such a power did not exist in the laws of Cheraman Perumal, by which the rulers of Malabar are bound, and from which they cannot deviate without the consent of their subjects. This was the reason why the Rajas and Chiefs of Malabar feared to prevent smuggling, as they were well aware of the illegality of the system of monopolies. The Dutch had, therefore, to bring military force to check smuggling, which was very expensive, and consequently the Malabar Command was almost invariably in debt. While the Dutch always insisted upon the performance of pepper contracts at a low rate and attempted to enforce preference to all others in the matter of supply, their European rivals always paid the market price or a little above it. Thus, in the long run, their European rivals succeeded in driving them from the pepper trade."

Though unsupported by sanctions, the system of monopoly was continued by every ruler who had occasion to wield power, as it definitely worked to his advantage. The rulers of Travancore began to exercise a right of monopoly over every important product of the State, such as

pepper, tobacco, salt, timber, cardamom, opium, ginger and indigenous liquor. Although the monopoly right over several of these was relinquished with the currency of free trade, the State still retains it over a few for political reasons.

Pepper.—The earliest monopoly right the State exercised was over pepper, which forms a staple product of the country. It is largely grown and has always commanded a good price in the market. Under the monopoly system the growers of pepper were bound to deliver the product into the Sirkar stores and to receive its price at a fixed rate. The Sirkar collected all the pepper at the port of Alleppey and annually sold it to the highest bidders. This system of taxing the product was found oppressive owing to the extractions of petty officials and the low rate of price paid to the grower in reference to the market prices of pepper. It was further full of abuses as it afforded opportunities for smuggling. The system was therefore changed in 1036 and the monopoly abolished. An export duty of Rs. 15 per candy, which comes to about 20 per cent. of its value, was substituted.

Tobacco.—Tobacco was also a State monopoly from the very earliest times. It was imported by the Government from British India and Ceylon and sold in the Sirkar's own bankshalls. Tobacco is considered to be the chief luxury of the Travancoreans. There is only a small percentage of them who do not use it in any of its forms. Naturally, therefore, it was considered to be a fit subject for public taxation and was for a considerable time subjected to a rigorous monopoly as in the neighbouring countries.

The tobacco monopoly worked as follows:—

“The Sirkar made direct purchase of tobacco of various kinds by entering into contracts with individuals for the supply of requisite quantities, the contract prices being determined by public competition. The contract used to be for three kinds of the commodity for the consumption

of each of which a particular part of the country was appropriated. It was obtained chiefly from Ceylon, Tinnevely and Coimbatore, the largest import being from the first and the smallest from the last mentioned territory. In the domain of each kind of tobacco no other kind was admitted on any account. The supplies were to be delivered by the contractors at stipulated periods so as to leave always a quantity on hand sufficient for consumption in the country for some months at least. It was brought only by certain appointed routes under precautions against smuggling and was lodged in certain warehouses whence it was distributed under permits to certain bankshalls where it was sold at monopoly rates to private dealers. These dealers in their turn sold the stuff in retail throughout the country at enhanced prices.

“The evils of these arrangements it requires no great discernment to perceive. In the first place, the contracts for making the supplies to the Sirkar required for fulfilment such large command of money, influence, intelligence and practical experience, that under the best encouragement only a very small number of persons could come forward to compete for such contracts. The field for competition having been so extremely circumscribed, the contractor generally contrived to stipulate for pretty liberal rates. This generally enhanced the price of the article, though not directly to the consumer. Then again, it was the interest of the contractor to supply as inferior an article as he might force on the Sirkar; and the Sirkar was often under the necessity of accepting it, lest by rejection it should expose itself to great loss of revenue arising from a sudden failure of the contractor, a loss too great to be made good by any contractor, and a failure too sudden to be counteracted by engaging another contractor. Inferior article was thus in a manner forced on the consumer and the smuggler came to enjoy the additional advantage of offering a superior article as if the lower price at which he was able to offer it was not in

itself sufficient temptation. The enormous price too at which the Sirkar sold the monopolised articles occasioned extensive contraband trade, carrying in its train its too obvious evils. This illicit trade had naturally a great tendency to increase and was able, at favourable times and under circumstances but too prone to recur, to inflict considerable, and sometimes unexpected, losses on the Revenue. Even more uncertainty arose from another contingency. The contractor was too frequently liable to fail whether from bad faith or from too great a rise in the prime cost of the tobacco he had engaged to supply. A failure of the contractor was almost certain to be followed by heavy injury to the Revenue. This was not all. The consumer in each circle having been accustomed to but one particular kind of tobacco, when that failed, he would not consume another, and the Sirkar was left without resource."*

Again, the monopoly system was open to objection for the double reason that the mode of deriving the revenue was itself opposed to sound fiscal principles and that taxation was carried too far to counteract the operations of the smuggler. In 1853 the tobacco monopoly in the British Provinces was abolished, and the difficulty here of preventing smuggling became greater then. This was in fact a severe blow. Malabar became a convenient basis for the operations of the smuggler. Cochin, Anjengo and Thangassery became so many centres of contraband trade.

In consequence of the abolition of the monopoly in Malabar it was free for any one to land under the protection of the British Government any quantity of tobacco at the three above mentioned places and thence to smuggle it with dangerous facility into the States in the body of which those places were situated. The States complained much about the heavy injury inflicted on their revenue by the smugglers thus obtaining entrance and acting under British protection.

* Administration Report for 1038.

The British Government endeavoured to render some assistance to prevent smuggling from Anjengo and Thangassery but would not afford any at the British port of Cochin, the chief basis of the smuggler's operation. A broad breach was thus made in the line of the preventive arrangements, and contraband tobacco poured in a stream which could not be stemmed with any great effect by the two States. As the British Government refused assistance, Travancore and Cochin had to do their best without the same. A considerable decline in tobacco revenue could not be prevented. This was pointed out to the Madras Government, who, as a result, imposed a tobacco duty of Rs. 150 per candy at the British port of Cochin. This very effectively checked smuggling into Travancore from that port. But the British Government soon afterwards abolished that duty and the difficulties of Travancore and Cochin were at once revived. The tobacco revenue of Cochin was most seriously injured and the relaxation of the monopoly in the territories of Cochin, conterminous as they were with those of Travancore, affected the revenues of Travancore likewise. The monopoly was in a sinking state, illicit traffic was carried on with increasing boldness, and the preventive service was deeply demoralised. It was evident that with the enormous facilities for contraband trade opened by the British port of Cochin in the midst of the States—facilities which were absent so long as the tobacco monopoly was maintained in the British district of Malabar to which the port of Cochin belonged, Travancore could not hope to maintain its monopoly on its former footing, and as the British Government could not be prevailed upon to levy a protective duty in their port of Cochin, it became necessary for Travancore to relax its monopoly. The first step taken was to lower the monopoly rates considerably. The usage was to sell tobacco to certain merchants appointed for each district and to no others. It was in fact a series of monopolies. The Sirkar had its monopoly, but under it a small knot of merchants held a monopoly for each district.

One great evil was that the price at which the consumer could get the stuff through the hands of the several monopolists was exceedingly high. Such a system was put an end to. Orders were sent to sell the tobacco not to a few but to all merchants of respectability. This freedom of trade and the reduction of the monopoly price by the Sirkar to the extent of about Rs. 5 lakhs have cheapened the articles to the consumer so largely that the consumption has since increased by no less than 50 per cent. The success which attended this step encouraged further progress in this direction. All dealers could now import tobacco on their own account, provided they paid the following import duty:—

Jaffna tobacco	Rs. 190 per candy.
Tinnevely tobacco	„ 140 „ „
Coimbatore tobacco	„ 65 „ „

This step in fact was tantamount to the dissolution of the monopoly in 1039 and the substitution of an import duty. In consideration of the pressure of the duty the importers are allowed by the Sirkar the privilege of keeping their goods in bond, a privilege without which the trade could never have prospered. But it was yet desirable to lower the duty.

Many of the evils of the monopoly were thus swept away. The trade was thrown open to all and the very best sorts of the commodity freely came in as well as the inferior kinds required by the poorer class of people. In short, demand and supply adjusted themselves under a natural unrestrained and spontaneous process and it became the direct interest of every honest dealer in tobacco to check smuggling. The import duty has since been subjected to successive reductions.

The tobacco required for consumption in the State is now imported by merchants on their own account by land, sea or rail and removed for consumption on payment of duty in the chowkey of import or bonded in the government

warehouses where it is allowed to remain in the joint custody of the Government and the merchants. The merchants remove the tobacco from the warehouses after paying the import duty. The varieties of tobacco imported are, as already noticed, Tinnevely, Jaffna and Coimbatore. The wholesale and retail vend of tobacco of all kinds is prohibited throughout the State except under license. The permit system relating to the import of beedi and beedi tobacco also prevails except in the Dēvikulam taluk and the Vandānmēṭṭu pakuthy of the Pīrmāle taluk. Licenses for the wholesale vend of tobacco are classified under three heads, viz.,

- (1) License for the vend of manufactured tobacco other than beedies.
- (2) License for the vend of beedi tobacco and beedies, and
- (3) license for the vend of preparations of tobacco including beedies.

The following restrictions relating to the trade in tobacco are also in force, viz.,

- (1) A Māl lābham licensee should import not less than 50 candies of (Coimbatore and Tinnevely) tobacco or not less than 10 candies of the Jaffna kind alone in a year.
- (2) A wholesale licensee who carries on business outside the old Dēvikulam division should sell not less than two candies of beedi tobacco or five candies of other varieties of tobacco, as the case may be, in a year.
- (3) A retail licensee should sell on an average not less than 15 pounds of tobacco in a month.

The consumption of duty-paid tobacco during 1111 was 16,867 candies. The fall in consumption was partly due to the decline in the purchasing power of the people.

Salt.—Salt was declared a monopoly in Travancore only in 988 M. E. (1813 A. D.), when Col. Munro was the Dewan of Travancore. The monopoly was declared by a Proclamation by which the sale of salt except to Government was made illegal and all the salt that remained in the

hands of the ryots and merchants on the date of the Proclamation was required to be delivered up to the Sirkar at a fixed rate within twenty days. Since then salt became the property of the Government and had to be sold at the price fixed by them

By Act I of 1805, the Madras Government introduced the monopoly system throughout the Presidency, by which the sale of salt except to the Government was made illegal and for reasons detailed elsewhere the Travancore Government had to follow suit. The Government monopoly on this article continues.

Timber.—In the early part of the last century teak was the only monopoly timber in the State. People were free to fell and remove every other kind of timber except that they had to pay a slight river duty when the timber was transported by water. In 1844 blackwood and anjili were declared monopolies and ebony and sandalwood were later on added to the list. The monopoly on teak standing on lands situated west of the Main Central Road and the Main Southern Road has been abolished by a Proclamation.

Cardamom.—Cardamom was gathered under a system of State monopoly. But it differed from other monopolies in that it affected only a very small area and a very inconsiderable section of the population. Under the monopoly system the lands were leased to the ryots who had to deliver the produce to the Government at a fixed valuation. The gradual supersession of the system in favour of a better one was kept in view so long ago as 1038, though the ryots were not then prepared for any change. Cardamom ryots were then given an increased rate of payment to augment production and to extend the area. A better system of picking was introduced but this proved ineffectual, as the inducements to growers were insufficient. Smuggling was another difficulty in the development of cardamom trade. Up to the year 1053 it had been customary to burn the chaff or light cardamom collected with the crop, the

object being to put it out of the power of the ryots to get possession of the same and make use of it to cover smuggling of the superior article. But in 1053 the inferior produce was advantageously sold at Alleppey, due precautions having been taken for the article being shipped off from Travancore beyond the possibility of finding its way to the cardamom ryots. The trade in cardamoms received another set back when a restriction was placed on the picking of unripe pods. This necessarily involved successive pickings and a prolonged stay of labourers on the hills. The ryots refused to adopt the plan unless the Government gave them a larger share of the produce. In 1050 the Government proposed to increase the ryot's share from $\frac{1}{3}$ to $\frac{2}{5}$ of the outcome of his crops and introduced experimentally the improved picking in one of the gardens. Since this period there was a regular clamour for the abolition of the monopoly. In 1071 the monopoly was abolished.

Opium and ganja.--For a long time in the past opium was an article of free trade, subject to an import duty of 10 per cent. on a tariff valuation of Rs. 13-2-0 per lb. In the year 1036 a Proclamation was issued which stopped the free trade in opium and ganja and instituted a source of revenue by a system of leases to the highest bidder. In 1049 the export of opium was subjected to a duty of Rs. 700 per chest of 140 lbs. in view to prevent evasion of the British revenue. In 1059 the import duty was relinquished by a Proclamation. The sale of opium was a State monopoly from the farming of which a revenue was derived. The importer paid the British Indian duty and brought the drug under permits granted by the British Resident. An additional import duty to the Travancore State operated as an inducement to smuggling through the State of Cochin which imposed no such duty and injuriously affected the revenue derived from the monopoly. It was consequently abolished,

By 1090 the monopoly system was abolished and the independent shop system introduced. According to this system, the Government gave the right of selling opium and ganja on contract to individuals in different parts of the country. Separate contracts were entered into with separate persons. This system continues to be in force to this day.

The opium required for the State is purchased from the Madras Taluk Office, while ganja is purchased from the British Indian store house at Vettapalam, and both the articles are issued from the Central Stores at Trivandrum. The supply to vend contractors is made by the Excise Department. Till 1930 the practice was to obtain opium and ganja from the Madras Stores on payment of the price of the quantity purchased and the duty thereon and also centage charges. At the end of every financial year the British Government used to grant a rebate of the duty on the articles supplied to this State. From the financial year commencing from the 1st April 1930 the Madras Government agreed to supply opium and ganja on payment of the cost price and centage charges only, thus doing away with the system of rebate duty. The issue price of opium was raised from B. Rs. 81 as. 8 per seer to B. Rs. 82 as. 8 per seer towards the end of the year 1110, and to B. Rs. 87 from Minam 1112.

Abkari:--The State has a monopoly over toddy and country liquor. The right of sale is farmed out taluk by taluk to the highest bidder who enters into certain stipulations. The contractors are forbidden from selling below a fixed rate. In 1054, a Regulation laying down the law relating to the collection of abkari revenue was enacted. This system was subsequently abolished and the present independent shop system introduced. Under the latter system the rights to vend toddy and arrack are separated and sold by auction shop by shop. The right of manufacture and vend of toddy is with the shop-keeper, who pays tax on every tree tapped. He can draw toddy only from trees licensed to him for the purpose

on payment of the prescribed tree tax. The right of sale of arrack alone is granted, the right of manufacture being with the Government who engage a contractor for its manufacture and supply to the arrack shop-keepers. On account of the hilly nature of the taluk and the consequent difficulties in transporting arrack thereto, the farming system in respect of arrack still continues in Dēvikūlam and toddy is not produced there. The Government have engaged a contractor for the manufacture and vend of arrack in that taluk and reserve to themselves the right to fix the number and location of shops in the area.

The value of the total trade of the State for ten years (1102 to 1111) is given in the following statement.

Year.	Exports B. Rs.	Imports B. Rs.	Total B. Rs.
1102	11,40,65,138	6,16,43,268	17,57,08,406
1103	11,84,08,817	8,23,81,910	20,07,90,727
1104	11,80,42,935	9,32,90,681	21,13,33,616
1105	11,29,39,039	9,36,10,748	20,65,49,787
1106	9,65,15,615	7,65,68,897	17,30,74,512
1107	7,51,16,153	6,49,29,804	14,00,45,957
1108	7,71,08,954	6,43,99,262	14,15,08,216
1109	7,78,97,856	6,29,16,056	14,08,13,912
1110	8,37,66,483	7,91,51,279	16,29,17,762
1111 (approximate)	8,16,00,000	7,43,00,000	15,59,00,000

The above figures will show that our external trade was increasing steadily up to 1104 and slightly again in 1110. The fall in the volume and value of trade between the years 1105 and 1109 was more or less due to the economic depression. Though there was a little increase of about Rs. 2 crores in value during 1110, there is yet a huge gap of more than Rs. 5 crores to reach the pre-depression level.

One important fact deserving attention is that the percentage of imports *inter se* has been disproportionately on the increase when compared with that of the exports. The comparative statement showing the commodity and the quantity and value of the exports and imports of Travancore will show that the import of luxuries has increased. The imports have been increasing at a more rapid rate than the exports. There is a complaint that the import of luxuries has increased to an extent out of all proportion to our income. This is a controversial point, as the correctness of the statement depends to a very great degree on the determination as to what constitutes luxury. There is at the same time a view that the rising imports and their variety are indices of a rising standard of life. But there is no doubt that we are importing far more necessities than luxuries, though the tendency of the latter is to increase out of all reasonable proportion to the former.

The balance of trade, judged by visible results, has been favourable for the last so many years, though here again there has been a divergence of opinion. The following statement showing the *per capita* values of the imports, exports and total trade for ten years from 1102 to 1111 will show that we still have a balance of trade in our favour.

Year	<i>Per capita</i> value of imports	<i>Per capita</i> value of exports	<i>Per capita</i> value total trade.
	Rs.	Rs.	Rs.
1102	15·4	28·4	43·8
1103	20·6	29·5	50·1
1104	23·29	29·46	52·75
1105	23·37	28·19	51·56
1106	15·02	18·94	33·96
1107	12·74	14·74	27·48
1108	12·64	15·13	27·77
1109	12·35	15·28	27·63
1110	15·53	16·44	319·7
1111	14·58	16·01	30·59

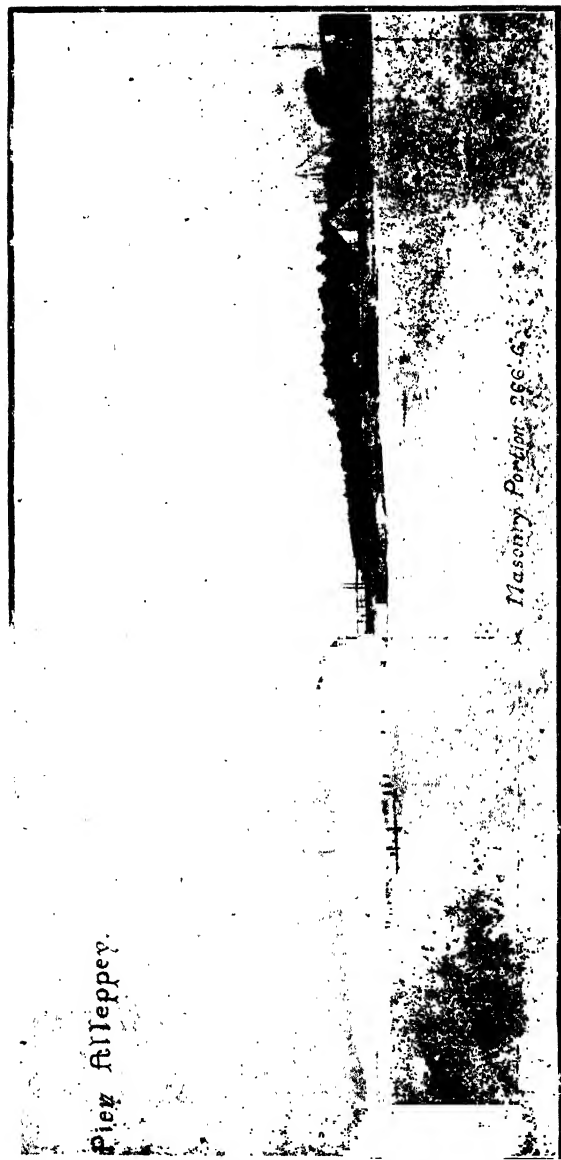
The entire value of the trade of Travancore, according to the figures furnished for the year 1111 amounted to Rs. 15·59 crores as shown below :—

Exports Rs. 8·16 crores.

Imports Rs. 7·43 crores.

Total Rs. 15·59 crores.

Of the total external trade 26·08 per cent. was carried on by sea, 44·16 per cent. by backwater, 13·69 per cent. by land, and 16·07 per cent. by railway. The sea-borne trade was mostly with European countries, while the trade by backwater was mainly with Cochin and partly with foreign



Pier Alleppey.

Massey, Philip, 1861.

The Pier at Alleppey.

countries through the port of Cochin. The Rail-borne and the road-borne trade was controlled by dealings with British Indian provinces and Cochin.

Of the external trade 85·79 per cent. was with British India, 6·61 per cent. with the United Kingdom, 2·28 per cent. with America, 0·73 per cent. with Pondichery and Marseilles and 4·49 per cent. with other foreign countries. The distribution of the external trade has more or less remained the same throughout the past several years. Though there has been a small degree of difference in the percentage allotted to each, the chief parties with whom trade was carried on have remained almost the same. The following statement will show that the variations have been slight.

Place	1101	1102	1103	1104	1105
	% & Rs.	% & Rs.	% & Rs.	% & Rs.	% & Rs.
British India	88·68 14,36,95,473	86·29 15,16,24,854	88·62 17,79,41,876	88·37 18,67,45,110	89·10 18,40,40,982
Pondichery & Marseilles	·05 88,254	·0 1,46,690	·06 1,21,775	·04 88,949	·07 1,40,328
Ceylon	2·87 46,52,580	2·64 46,37,987	1·73 34,79,649	1·51 31,88,981	1·32 27,33,675
United Kingdom	4·10 66,45,886	4·54 79,83,140	4·32 86,64,991	3·93 83,11,696	4·63 95,66,267
America	1·66 26,80,108	2·96 51,94,513	3·15 63,25,634	3·71 78,34,829	2·89 59,60,951
Other countries	2·64 42,74,690	3·49 61,21,222	2·12 42,56,802	2·44 51,64,051	1·99 41,07,584
Total	100·00 16,20,33,991	100·00 17,57,08,406	100·00 20,07,90,727	100·00 21,13,33,616	100·00 20,65,49,787

Place	1106	1107	1108	1109	1110
	% & Rs.	% & Rs.	% & Rs.	% & Rs.	% & Rs.
British India	88·51 15, 1,90,496	87·74 12,28,81,252	86·83 12,28,70,808	88·42 12,45,09,037	88·12 14,35,62,291
Pondichery & Marseilles	·15 2,62,201	·12 1,66,112	·19 2,67,491	·12 1,70,114	·09 1,41,386
Ceylon	·94 16,28,549	·44 6,11,919	1·00 14,22,813	·72 10,18,860	1·40 22,83,635
United Kingdom	5·37 92,91,952	7·26 1,91,72,763	7·33 1,03,70,789	6·13 86,30,807	5·23 85,23,452
America	2·70 46,62,830	1·93 27,01,353	1·83 25,84,445	1·78 24,99,471	1·58 25,78,601
Other countries	2·33 40,31,493	2·51 35,13,428	2·82 39,91,870	2·83 39,85,623	3·58 58,28,397
Total	100·00 17,30,74,512	100·00 14,00,45,957	100·00 14,15,08,216	100·00 14,08,13,912	100·00 16,29,17,762

The principal British Indian ports to which shipments are made are Cochin, Calicut, Bombay, Karachi, Tuticorin and Calcutta in India, Rangoon in Burma and Colombo and Jaffna in Ceylon. The most important foreign countries with which trade is carried on are the United Kingdom, Burma, Ceylon, Federated Malay States, America, Pondichery, Marseilles, Germany, Italy, Persia, Arabia, Australia and Czechoslovakia. The sea-borne trade is carried on through the ports Alleppey, Quilon, Trivandrum and Colachel.

The principal crops produced in the country, which form the main items of exports, are the produce of the coconut palm, i. e., (copra, coconuts, coir, coir-fibre, coir mats, coir matting, coir druggets, cables, coconut oil, coconut husk, punnac, pepper, ginger, turmeric, arecanuts, rubber, tea, cardamoms, jaggery and other produces of the palmyra palm, molasses, tapioca, cashew nuts, ilmenite sand, monazite, etc. The following table shows the value of articles exported from 1101-1110.

Exports.

Statement showing the value of exports of the principal articles of merchandise for 10 years.

Articles	1101	1102	1103	1104	1105
1. Copra	1,08,70,247	91,87,688	83,14,009	76,46,518	67,43,419
2. Coconuts	10,88,734	10,95,413	9,82,116	11,67,179	14,54,998
3. Coir	95,37,422	1,14,31,024	1,08,89,798	1,13,04,491	1,10,17,135
4. Cables	5,251	4,779	3,495	4,849	3,391
5. Coir fibre	38,981	34,045	56,676	60,220	47,372
6. Coconut husk	1,07,146	83,035	1,06,272	1,14,107	33,788
7. Coconut oil	75,85,503	76,37,486	64,32,495	65,08,511	81,56,131
8. Punnac	10,24,428	11,23,448	11,37,683	11,56,306	15,08,398
9. Arecanuts	12,04,930	14,46,951	15,68,861	17,27,773	18,88,650
10. Jaggery	4,77,053	11,35,676	4,99,283	6,63,603	4,19,554
11. Coffee	44,779	86,633	2,04,800	93,644	36,347
12. Ginger	28,15,087	31,72,443	24,81,962	25,01,977	27,40,344
13. Hide	2,49,349	2,97,207	3,82,645	3,21,922	2,71,597
14. Fish	21,85,879	30,69,338	36,49,446	40,93,367	39,93,457
15. Tamarind	7,43,760	4,69,455	4,06,217	15,72,864	5,14,757
16. Molasses	3,25,439	3,49,682	2,44,045	3,84,552	3,50,545
17. Pepper	75,70,041	1,31,70,743	1,66,18,119	1,87,59,186	1,79,82,774
18. Timber	9,06,404	12,49,693	11,99,329	12,06,156	12,41,359
19. Coir mattings	28,14,758	36,17,255	41,65,246	42,18,357	39,13,429
20. Coir mats	25,13,328	44,44,624	48,58,620	41,71,443	41,90,803
21. Rice goods	5,35,644	3,75,211	8,07,908	6,18,079	8,49,984
22. Cardamoms	22,63,629	52,13,481	14,11,560	22,35,366	25,85,776
23. Tea	2,67,82,076	2,59,88,769	3,08,58,759	3,04,35,738	2,72,60,724
24. Rubber	1,11,29,992	90,70,631	83,13,903	58,34,344	51,21,879
25. Other articles	98,34,928	1,03,10,428	1,28,14,575	1,22,41,583	1,06,12,428
<i>Total ...</i>	<i>10,26,54,128</i>	<i>11,40,65,138</i>	<i>11,84,08,817</i>	<i>11,80,42,935</i>	<i>11,29,39,039</i>

Statement showing the value of exports of the principal articles of merchandise for 10 years.

Articles	1106	1107	1108	1109	1110
1. Copra	76,72,404	41,77,461	48,05,141	21,52,539	25,38,301
2. Coconuts	11,40,699	10,84,022	10,15,758	4,80,090	7,95,488
3. Coir	88,91,735	69,67,613	65,66,491	70,08,513	67,42,341
4. Cables	2,805	12,267	3,060	5,015	5,211
5. Coir fibre	44,377	51,059	46,518	38,115	5,119
6. Coconut husk	15,193	24,499	24,151	26,246	21,626
7. Coconut oil	92,04,225	54,35,493	58,10,602	58,12,902	75,98,457
8. Punnac	15,01,002	11,38,118	12,29,898	6,75,042	8,75,681
9. Arecanuts	14,81,754	13,88,497	18,19,256	10,81,476	11,87,581
10. Jaggery	7,51,314	10,18,710	3,31,441	2,65,806	
11. Coffee	3,79,359	28,074	1,41,225	1,34,617	1,68,200
12. Ginger	38,67,991	24,94,204	23,45,221	9,90,743	8,87,093
13. Hide	2,35,235	2,63,926	3,00,034	2,56,550	3,50,405
14. Fish	31,24,080	27,26,357	20,25,950	18,70,772	23,78,646
15. Tamarind	4,41,498	6,75,852	5,57,644	1,40,317	1,74,090
16. Molasses	2,76,116	2,46,336	2,29,121	95,103	2,46,531
17. Pepper	94,91,863	62,45,919	68,05,443	70,89,627	39,63,639
18. Timber	11,17,774	26,27,103	10,28,003	10,10,839	9,93,632
19. Coir mattings	37,05,093	44,32,690	33,46,480	39,95,409	37,33,223
20. Coir mats	40,08,926	42,17,130	36,94,504	36,65,293	35,00,953
21. Rice goods	7,32,908	4,93,075	4,14,091	2,99,740	9,92,569
22. Cardamoms	24,33,195	8,62,171	14,81,646	14,74,569	17,14,637
23. Tea	2,21,46,342	1,75,89,638	1,75,13,004	2,01,53,091	2,02,96,123
24. Rubber	34,94,453	8,54,117	3,69,142	17,29,258	34,95,398
25. Other articles	1,03,55,274	1,00,61,822	1,52,05,030	1,74,43,178	2,02,20,283
Total ...	9,65,15,615	7,51,16,153	7,71,08,954	7,78,97,856	8,37,66,483

Of these articles of export the most prominent are the products of the coconut palm. The prices of coconut

Coconut products. and its products, more or less the main stay of Travancore agriculture, have reached a very low level. The prices have been recording a marked decline. There has been tremendous reduction in the prices of coir goods in foreign markets, in many cases exceeding even 50 per cent. The value of the export of coir and coir manufactured goods through the ports of Alleppey and Cochin fell from over Rs. 2½ crores in 1105 to nearly Rs. 1½ crores in 1110.

The following table gives the quantity and value of the different products of the coconut palm exported from Travancore since 1101 M. E.

Quantity and value of the products of the coconut palm exported from Travancore
since 1101 M. E.

Articles	Units	1101		1102		1103	
		Quantity	Value Rs.	Quantity	Value Rs.	Quantity	Value Rs.
Copra	Cwts.	4,83,122	1,08,07,247	4,56,818	91,87,688	4,61,889	83,14,009
Coconuts	Nos.	1,61,29,091	10,88,734	1,89,75,640	10,95,413	1,93,99,838	9,82,116
Coir	Cwts.	6,35,828	95,37,422	7,62,068	1,14,31,204	7,25,985	1,08,89,798
Coir fibre	Cwts.	3,887	38,931	3,409	34,045	5,664	56,676
Coir mats	Cwts.	1,04,292	25,13,328	2,13,175	44,44,624	2,56,439	48,58,620
Coir matting	Yds.	26,35,843	28,14,758	36,21,503	36,17,255	39,38,870	45,61,241
Coir rug	Yds.	...	...	250	1,280	4,305	17,378
Coir druggets	Yds.	...	...	...	...	...	...
Cables	Cwts.	525	5,251	478	4,779	350	3,495
Coconut oil	Cwts.	4,04,560	75,85,503	4,19,788	76,37,486	4,28,900	64,33,495
Coconut husk	Cwts.	13,393	1,07,146	10,379	83,635	13,284	1,06,275
Punnac	Cwts.	2,04,886	10,24,428	2,24,690	11,23,448	2,27,537	11,37,683

Quantity and value of the products of the coconut palm exported from Travancore
since 1101 M. E. (continued)

Articles	Units	1104		1105		1106	
		Quantity	Value Rs.	Quantity	Value Rs.	Quantity	Value Rs.
Copra	Cwts.	4,21,064	76,46,518	3,37,171	67,43,419	3,86,157	76,72,404
Coconuts	Nos.	2,21,46,045	11,67,179	2,34,31,585	14,54,998	1,83,21,821	11,40,699
Coir	Cwts.	7,33,625	1,13,04,491	73,474	1,10,17,135	5,39,723	87,50,746
Coir fibre	Cwts.	6,008	60,226	4,732	47,372	4,591	44,377
Coir mats	Cwts.	1,73,382	41,71,448	1,76,069	41,90,803	1,73,390	40,08,926
Coir matting	Yds.	42,75,873	42,18,357	42,99,637	39,13,429	37,49,358	37,05,093
Coir rug	Yds.	3,27,656	3,21,254	9,10,966	9,04,252	5,75,923	5,37,296
Coir druggets	Yds.	...	...	97,641	87,956	36,905	34,650
Cables	Cwts.	485	4,849	339	3,391	280	2,805
Coconut oil	Cwts.	4,33,893	45,08,511	5,43,739	81,56,131	6,20,991	92,04,225
Coconut husk	Cwts.	14,337	1,14,707	4,223	33,788	2,098	15,193
Punnac	Cwts.	2,31,301	11,56,506	3,01,679	15,08,398	3,00,200	15,01,002

Quantity and value of the products of the coconut palm exported from Travancore
since 1101 M. E. (continued)

Articles	Units	1107		1108	
		Quantity	Value Rs.	Quantity	Value Rs.
Copra	Cwts.	2,61,091	41,77,461	3,00,321	4,80,51,141
Coconuts	Nos.	2,25,81,209	10,84,022	2,11,60,543	10,15,758
Coir	Cwts.	5,81,152	69,67,613	5,49,019	65,66,491
Coir fibre	Cwts.	5,134	51,059	4,967	46,518
Coir mats	Cwts.	1,75,650	42,17,130	1,96,017	36,94,504
Coir matting	yds.	44,84,944	44,32,690	35,10,363	33,46,480
Coir rug	yds.	9,59,455	8,78,565	34,58,447	34,21,164+
					other manu- factures of coir
Coir druggets	yds.	20,920	20,885	14,471	14,485
Cables	Cwts.	1,227	12,267	306	3,060
Coconut oil	Cwts.	4,52,957	54,35,493	4,84,217	58,10,602
Coconut husk	Cwts.	6,125	24,499	6,037	24,151
Punnac	Cwts.	2,27,620	11,38,118	2,31,242	11,96,212

Quantity and value of the products of the coconut palm exported from Travancore
since 1101 M. E. (concluded)

Articles	1109		1110		
	Units	Quantity	Value Rs.	Quantity	Value Rs.
Copra	Cwts.	8,19,464	21,55,539	3,17,254	25,38,301
Coconuts	Nos.	2,23,56,236	4,80,090	2,06,22,851	7,95,488
Coir	Cwts.	6,49,060	70,08,513	7,00,685	67,42,341
Coir fibre	Cwts.	6,109	38,115	5,648	35,119
Coir mats	Cwts.	1,86,198	30,65,293	1,95,518	35,00,953
Coir matting	yds.	46,70,832	39,95,409	41,05,952	37,33,223
Coir rug	yds.	35,89,322+	28,49,937+	31,09,611+3553,	24,88,035+
		other manufac- tures of coir	other manufac- tures of coir	the manufac- tures of coir	other manufac- tures of coir
Coir druggets	yds.	47,946	48,640	64,170	64,299
Cables	Cwts.	405	5,015	391	5,211
Coconut oil	Cwts.	5,81,758	58,12,902	6,11,190	75,98,457
Coconut husk	Cwts.	8,319	26,246	8,016	21,626
Punnac	Cwts.	2,72,395	6,75,052	2,77,935	8,75,681

The following table shows the price of coconut oil from 1102 M. E.

Year	Highest price per candy.			Lowest price per candy.		
	Rs.	As.	P.	Rs.	As.	P.
1102	156	0	0	133	0	0
1103	150	0	0	195	0	0
1104	167	0	0	130	0	0
1105	138	0	0	106	0	0
1106	107	0	0	80	8	0
1107	87	0	0	39	0	0
1108	66	0	0	37	0	0
1109	75	0	0	50	0	0
1110	97	0	0	56	0	0
1111	88	0	0	82	0	0

Coir yarn.

Year	Highest price per candy.			Lowest price per candy.		
	Rs.	As.	P.	Rs.	As.	P.
1102	129	0	0	102	8	0
1103	116	0	0	85	0	0
1104	120	0	0	89	0	0
1105	122	0	0	75	0	0
1106	110	0	0	53	0	0
1107	76	0	0	52	0	0
1108	64	0	0	59	0	0
1109	98	0	0	64	0	0
1110	71	0	0	55	0	0
1111	86	0	0	27	0	0

Latterly the coconut tree has fallen on evil days. A decade prior to the great European war the prices of coconut products had been steadily on the increase and eventually doubled themselves. But during the last ten years the prices declined steadily and rapidly, so much so, the price of copra per candy of 654 pounds fell from Rs. 103 (highest) and Rs. 86 (lowest) in 1102 to Rs. 57 (highest) and Rs. 40 lowest in 1111. A statement showing the highest and lowest prices of copra for the last ten years is sub-joined.

Year.	Highest price per			Lowest price per		
	candy.			candy.		
	Rs.	As.	P.	Rs.	As.	P.
1102	103	0	0	86	0	0
1103	128	0	0	105	0	0
1104	114	0	0	82	0	0
1105	90	0	0	65	0	0
1106	71	0	0	52	0	0
1107	82	0	0	56	0	0
1108	78	0	0	48	0	0
1109	48	0	0	34	0	0
1110	51	0	0	35	0	0
1111	57	0	0	40	0	0

The export of copra and coconut oil received a sudden check by 1102 due to the imposition of an import duty, which had the effect of shutting out foreign copra and raising local prices above the level of the prices offered in foreign markets, with the natural consequence that India as a producer of copra and coconut oil was no longer a factor in foreign markets and the producer's fortunes were tied to the local market. Fortunately, however, India showed an increasing tendency to absorb the local production by developing several industries which consumed the oil produced in India. This helped to keep up the prices. But the

high reputation which Travancore products commanded in the world market fell as the demand for the same decreased owing to the introduction of substitutable oil in the markets of Europe and America. This has been responsible for coconut producers focussing their attention exclusively to the Indian markets. As has been mentioned above, the Indian producer of coconut obtained protection against foreign growers by the imposition of an import duty. This policy was calculated to encourage the import of Ceylon coconuts, copra and coconut oil in large quantities. Travancore has no voice in the regulation of the tariffs. The import duty is neither a specific duty nor *ad valorem*, but a duty on a tariff value which the Government of India fixes from time to time. The tariff value on copra was reduced from Rs. 23 in 1929 to Rs. 10 in 1934. The result of this reduction in tariff was the decline in the quantity of copra and coconut products exported. As a natural corollary, imports of foreign copra increased. Ceylon which developed coconut cultivation to a very large extent recently, began to dump her coconut products into India. This led to Travancore losing her markets in British India. The remedy lay in the retention of the import duty on a high tariff rate. But British Indian capitalists who were more interested in the development of their trade in piece goods with Ceylon were intent on the further reduction of import duty for the sake of reciprocity. They even tried to get the import duty on copra totally abolished. The Travancore Government who took up the question strongly protested against the suggested abolition and endeavoured to secure from the Government of India an assurance that the duties would at least be retained at the level then current. It was at this time that the Ottawa Agreements were hatched and further preferences given to Ceylon. A further reduction of tariff was the result. Consequently, Ceylon and Singapore copra was imported into India in vast quantities. Indian grown copra was being produced at prices below the cost of

production—prices which literally meant starvation to the population and neglect of cultivation. Foreign copra consequently entered the Indian market not only below the cost of production in India but also below the cost of production in Ceylon. The Government of Travancore again took up the question and demanded that the Government of India should impose on foreign copra a duty sufficient to ensure that foreign copra shall not enter India at prices below the cost of production in India plus a reasonable margin of profit. The Government of India as a result caused a sub-committee of the Imperial Council of Agricultural Research to investigate the claims for protection. But no solution has been arrived at yet. Another complaint is that there is no fixity or steadiness in British Indian tariffs. Often they are but pawns in the game of the empire. The question has been reopened by the Government of India and the Chief Executive Officer of the Imperial Council of Agricultural Research recently visited Travancore to study the problem on the spot. The question is still engaging the attention of the Governments.

The abnormal fall in the exports of the coconut products of the State has been due to other reasons as well. The inability of our supply to meet the demand of the Indian markets is also an important factor in the decline of our exports. On account of the heavy drop in prices during the past two years the coconut grower was not in a position to till the land properly and manure the palms adequately. To add to this, the seasons also have been unfavourable, especially in 1110. These two causes have reduced the yield of our coconut palms and the present fall in exports is really symptomatic of the true position of our coconut industry. Low prices, agricultural indebtedness and poor yield move in a vicious circle and any improvement in the position of the industry can be anticipated only if organised effort is made towards lightening the burden of the grower and increasing the output. Tariff manipulation may be able

to secure slightly higher prices for coconut products, but that cannot bring any lasting benefit to the indigenous industry. Substantial improvement can only be the result of definite planning. To lighten the burden of the coconut cultivator who is subjected to a tree tax and an export duty, the Government have reduced the export duties. The demand of the coconut cultivators is for the complete abolition of the export duty and the enhancement of the existing import duties on a definite protection basis.

Pepper.—Alleppey pepper always commands in the London markets a higher price than the pepper from Singapore, Lampeng and Muntak. Travancore pepper is exported to Europe and America and to Bombay, Calcutta and other Indian ports. The product of Travancore is about 1/3 of the world production. There is a very extensive home market in India for our pepper. Pepper is one of the few commodities which have not so far been affected by the problem of over-production. But its price has gone down on account of the lack of purchasing power on the part of its customers. Peak prices were obtained in 1927-28 when it rose up to Rs. 627 per candy. Consequently a great incentive was given to pepper cultivation in Travancore, but from 1929 the prices began to fall. The following statement shows the rapid fall in pepper prices since 1102 :—

Year	Highest price per candy.			Lowest price per candy.		
	Rs.	As.	P.	Rs.	As.	P.
1102	520	0	0	290	0	0
1103	635	0	0	445	0	0
1104	582	0	0	447	0	0
1105	520	0	0	280	0	0
1106	280	0	0	140	0	0
1107	226	0	0	174	0	0
1108	204	0	0	122	0	0
1109	160	0	0	120	0	0
1110	200	0	0	120	0	0
1111	205	0	0	120	0	0

Though the lowest price in 1110 is shown to be Rs. 120 in the above statement, pepper reached the record low price of Rs. 85 per candy in the course of that year. It was expected some time back (at the time when the Economic Depression Enquiry Committee's Report was written) that there would never happen a decrease in the volume of export, but the tremendous fall in prices has belied all expectations. The quantity exported in 1110 went down by above 40 per cent. Possibly stocks have been held up in expectation of better prices. Pepper is one of the few articles produced in this country that can, if well dried and stored, be withheld from the market for several years. The difficulty of finding out a substitute for pepper and the certainty of finding a market at some time or other have induced some merchants to indulge in great speculations regarding pepper. Pepper merchants had been obliged to suffer an additional hardship of an enhanced export duty from Rs. 5 to 10 per candy when prices were on a steady increase. The demand also is shrinking. Till recently, America was our best market. America has now practically ceased to import our pepper. London does not seem to have cleared all the stock accumulated during the attempted corner of 1934. The outlook is rather gloomy. The figures for the export of pepper for the last ten years are given below :—

Year	Quantity Candy	Value Rs.
1101	37,471	75,70,041
1102	53,184	1,31,70,743
1103	34,124	1,66,18,119
1104	38,432	1,87,59,186
1105	43,887	1,79,82,774
1106	48,516	94,63,617
1107	32,501	62,45,919
1108	42,587	68,05,443
1109	51,523	70,89,627
1110	28,719	39,63,639
1111	38,658	36,82,304

Ginger.—The principal foreign markets for this article are the United States of America, the United Kingdom, Germany and Italy. Travancore ginger is mostly exported to British India and the export to the United Kingdom shows an abrupt fall. Ginger from India has lost its market in London as the Ministry of Health has prohibited the import of ginger which has been treated with sulphur dioxide. This treatment improves the colour of the article. But other countries are able to put on the market good ginger without such adventitious process. This has adversely affected Travancore ginger. During the depression days there was a fall in the price of ginger and in 1106 its tariff value was reduced from Rs. 25 and 37½ (unscraped and dry) to Rs. 16 and 25 per cwt. Since then the prices have been gradually recovering, though subject to fluctuation mainly due to poor output and shortage in the market. The following figures show the quantity and value of ginger exported from Travancore from 1102 to 1111.

Year	Quantity Cwts.	Value Rs.
1102	87,489	31,72,443
1103	68,910	24,81,962
1104	68,370	25,01,977
1105	74,354	27,40,344
1106	1,05,839	38,67,991
1107	1,01,805	24,94,204
1108	97,164	23,45,221
1109	94,748	9,90,743
1110	42,377	8,87,093
1111	46,818	13,60,630

Turmeric. This is mostly exported to Indian and foreign markets. The principal foreign markets for this article are the United States of America, the United Kingdom, Germany and Italy. The prices have been steadily declining of late. Its tariff value has been reduced from Rs. 15 to 10 per cwt. Exports have been falling considerably. Demand and supply are meagre. The figures below show the exports for the last ten years.

Year	Quantity Cwts.	Value Rs.
1102	15,212	2,12,510
1103	10,967	1,59,158
1104	18,037	2,60,100
1106	20,167	2,61,120
1106	17,508	2,46,455
1107	21,705	2,08,521
1108	24,409	2,32,425
1109	18,654	1,31,836
1110	11,712	1,15,254
1111	14,452	1,70,536

Arecanut.--A large portion of the produce of this article is used for internal consumption. But a considerable quantity is also exported. It is exported to the neighbouring British Indian territories by rail or by road. The trade is entirely in the hands of middle men. They collect them in open markets or in the farms. An export duty of 5 per cent. on a tariff value of B. Rs. 200 per candy of 500 lbs. was imposed on arecanut kaḷi with effect from the 1st Minam 1110. The figures for the export trade for the last ten years are given below :—

Year	Quantity Candy.	Value B. Rs.
1102	9,789	14,46,951
1103	9,402	15,68,861
1104	9,481	17,27,773
1105	10,475	18,88,650
1106	8,615	14,81,754
1107	7,393	13,88,497
1108	10,585	18,19,256
1109	9,323	10,81,476
1110	11,632	11,87,581
1111	7,060	7,82,699

Tapioca.—This is an important article of home consumption. But a large quantity of it is exported, though the exported quantity represents only a very small fraction of the output. British India is the market for tapioca. The price of tapioca is governed by that of paddy. It cannot rise so long as Burma paddy is sold in Travancore so cheaply as at present. The quantity and value of tapioca exported from 1102 to 1111 are shown in the accompanying statement.

Year	Quantity Cwts.	Value Rs.
1102	1,03,434	2,28,962
1103	2,75,329	6,89,551
1104	1,61,014	3,17,564
1105	1,71,722	2,83,146
1106	58,439	1,35,487
1107	1,01,187	2,27,113
1108	33,987	1,39,562
1109	8,502	46,522
1110	6,207	41,471
1111	1,04,952	1,16,288

Timber.—A considerable export trade is being conducted in timber which is one of the major products of the State. The system of its sale has been described in detail in the chapter on Forests. Timber as a monopoly has also been treated at length under the heading monopolies. The export of timber has been treated under three heads:—Royalties, mango wood and jack wood (planks and logs) and other timber. The statistics pertaining to this for the last ten years are given below. An export duty was imposed on mango wood and jack wood logs at 10 per cent. on a tariff value of B. Rs. 2 and B. Rs. 3 per c. ft. respectively.

Year.	Quantity c. ft.	Value B. Rs.
1102	5,01,499	12,49,693
1103	5,96,596	11,99,329
1104	7,10,173	12,06,156
1105	7,19,838	12,41,359
1106	8,00,668	11,17,774
1107	15,37,536	26,27,103
1108	6,34,525	10,28,003
1109	16,94,657	10,10,839
1110	15,89,811	9,93,632
1111	15,46,282	9,08,252

Mango wood, planks & logs.

Jack wood, planks & logs.

Year.	Quantity. c. ft.	Value B. Rs.	Quantity c. ft.	Value B. Rs.
1102	84,136	1,68,273	862	2,588
1103	73,219	1,46,438	1,855	3,566
1104	75,090	1,50,183	1,360	4,081
1105	77,072	1,54,145	2,068	6,203
1106	68,948	1,37,898	2,105	6,319
1107	81,982	1,63,969	1,708	5,125
1108	83,883	1,67,772	2,696	8,089
1109	83,147	78,944	3,419	5,748
1110	87,899	73,996	3,813	6,992
1111	65,994	46,768	3,656	5,759

Cardamoms.—We have seen that the State monopoly on cardamoms was abolished in 1071. Unrestricted trade developed as a consequence and Travancore continued to export large quantities of cardamoms every year. The following figures show the quantity and value of the export of cardamoms for the last ten years.

Year.	Quantity cwts.	Value Rs.
1102	15,034	52,13,481
1103	6,378	14,11,560
1104	38,529	22,35,366
1105	14,949	25,85,776
1106	14,801	24,33,195
1107	7,277	8,62,171
1108	13,628	14,81,646
1109	14,006	14,74,569
1110	13,597	17,14,637
1111	8,622	9,78,673

The chief markets in India are Bombay and Karachi. There is also some export to the United Kingdom, U. S. A., Persia and Arabia. The trade in cardamoms has been considerably affected by the decrease in yield owing to the attack of insects and fall in the prices. The quantity of cardamoms exported in 1110 was less than that in the previous year, but the value realised was higher. A sum of Rs. 7,135 was realised on cardamoms by the Forest Department in 1111.

Tea.—Tea is one of the main plantation products of Travancore which commands a considerable volume of the export trade of the country. Travancore puts on the market two classes of tea, viz., the high grade and the low grade. The market for high grade teas is London, where it is sold through tea brokers. But in the case of low grade

tea and tea dust, the market is either Cochin or Bombay. About 50 per cent. of Travancore tea is estimated to be high grade for which there is always a demand from the European markets. There is a vast home market for Travancore tea in India. The prices of tea suffered a serious fall during the depression days. But owing to the exertions of the India Tea Cess Committee the price of tea is gradually gaining ground. The trade in tea stands on a different footing in Travancore, as the Government of Travancore levies an export duty of Re. 1- As. 8 per 100 lbs. on all tea exported from the State from the 15th May, 1927. The quantity and value of tea exported during 1110 were 29 million cwts. and B. Rs. 2.03 crores respectively. Travancore tea is gradually losing several of its markets. It has lost ground in Germany. Germany insists on the Indian exporter of tea buying three times its value of German goods. France gets its supply from French Indo-China which has not joined the Tea Restriction Scheme. Russian imports have declined. In spite of the Tea Cess Committee (now the International Tea Market Expansion Board) spending £ 50,000 annually for a number of years on tea propaganda in America, the intake does not show improvement. The consumption in India has, however, progressed much more than in our countries. The Indian Tea Cess Act has been amended so as to enable an increase in the rate of cesses as also the number of Indians on the Committee. Travancore planting interests have been ignored. A representation made to the Government on the subject is pending. The following figures represent the trade figures of tea for the years 1102 to 1111 M. E.

Year.	Quantity lbs.	Value Rs.
1102	2,52,15,064	2,49,14,614
1103	3,11,86,423	3,08,58,759
1104	3,04,52,556	3,04,35,768

Year.	Quantity lbs.	Value Rs.
1105	2,85,83,181	2,72,60,724
1106	2,76,21,187	2,21,46,342
1107	3,11,00,836	1,75,89,638
1108	3,03,70,738	1,75,13,104
1109	2,90,17,247	2,01,53,091
1110	2,90,62,111	2,02,96,173
1111	3,00,35,065	1,79,10,845

Rubber.—The statistics of the export of rubber from 1102 to 1111 are given below.

Year.	Quantity lbs.	Value Rs.
1102	76,26,306	90,70,631
1103	77,79,844	83,13,903
1104	92,92,799	58,34,344
1105	1,01,85,818	51,21,879
1106	96,65,452	34,94,453
1107	31,63,023	8,54,117
1108	15,75,543	3,69,142
1109	72,81,997	17,29,258
1110	1,37,01,590	34,95,398
1111	2,10,89,219	63,20,613

The figures will speak volumes on the extent of the fall in price of the commodity during the period under review. Scientific cultivation and extension of plantation increased the total output and in spite of the lowest prices on record sheer financial stringency compelled the planters to throw all possible produce on the market at whatever price they were able to obtain. The slump in the prices of rubber has ruined many a planter in Travancore. The price of

rubber being far below the cost of production, most of the estates in Travancore disbanded their labour force, curtailed their establishment to the barest minimum and ceased to work altogether. Indebtedness amongst small planters increased heavily and many of them became considerably embarrassed. Having no reserves and no credit, the planters found it very difficult to undertake the minimum expenditure that is necessary to maintain their estates without allowing them to go into neglect. The industry was nearly paralysed and tapping the trees virtually ceased from 1105. The slump continued till 1109 when, with a view to create a demand for rubber, an International Committee was constituted in Europe, restricting the production and export of rubber, and a Licensing Committee was appointed to restrict the production and export of rubber from the plantations of South India. The necessary rules for fixing the quota for production and export were also published. This encouraged the planters to work the estates and as a consequence there was a rapid revival of trade in unmanufactured rubber in 1109. The exports increased to 72,81,997 lbs. from 15,75,543 during 1108—an increase of nearly 465 per cent. The restriction scheme came into actual operation with the close of the year. The provisional quota was fixed early in 1110. This revived the industry. Tapping progressed in all estates and the product was readily sold under the quota system at a price which left a small margin of profit to the planter. Kōṭṭayam became the centre of the rubber trade in India. But the Indian trade is still under a disadvantage as Burma is even now allowed to export rubber to India without a certificate of origin, though separate quotas have been allotted to Burma and India. Exporters of rubber are now looking forward with hope to get over this anomaly towards the anticipated repercussions of the Burma separation.

Cashew nut.—Cashew nut is a recent entrant into the Travancore export trade. The first shipment of cashew nuts

from Travancore to the United States was made in 1924, and within a period of twelve years the export trade has developed enormously as is evident from the statistics given below:—

Year.	Tons exported.	Per cent. Increased.
1106	1,323·5	7 ...
1107	2,363·6	78·6
1108	2,703·8	14·4
1109	3,339·9	23·5
1110	4,601·8	37·8
1111	5,937·4	29·0

The total exports of cashew nuts from British India to the U. S. A. during the period 1934-1936 were as follows:—

Year.	Quantity in lbs.	Value.
1934	1,46,10,967	£4,61,664
1935	2,22,12,510	£7,26,815

January to May

1936	66,96,326	£2,03,015
------	-----------	-----------

Separate figures are not available to show exactly the exports from Travancore during the same period, as our statistics are maintained by the Malabar year. Nevertheless, judged on the available data, it is obvious that Travancore contributes over 50 per cent. of the total annual exports from British India to the U. S. A.

At present the United States are practically the only market for Travancore cashew nuts. About 95 per cent. of our exports go to New York, 4 per cent. to Motreal, Quebec and Toronto in the Dominion of Canada, and 1 per cent. to England. The English import of almonds annually amounts to £ 12,50,000, while the import of cashew nuts is so insignificant that the British Customs keep no separate statistics for their import of this particular commodity. There is no reason why our nuts, if properly advertised, should not

replace almonds at least partly. With the number of factories in Travancore steadily increasing, we shall soon reach a stage when our production of manufactured kernels will be far in excess of the demand. The need for exploiting other markets cannot, therefore, be over-emphasised.

The following table shows the quantity and value of cashew nuts exported from 1102 to 1111.

Year.	Quantity cwts.	Value Rs.
1102	27,542	2,41,007
1103	49,072	2,97,676
1104	63,034	4,25,316
1105	25,153	7,49,314
1106	26,269	7,68,718
1107	47,272	11,11,424
1108	..	..
1109	66,797	24,92,102
1110	92,036	41,73,812
1111	1,18,747	60,10,493

There are various other commodities that are exported from this country. The following statements give the statistics of trade for the past ten years.

Fish :—

Year.	Quantity cwts.	Value Rs.
1102	2,11,498	30,69,338
1103	2,58,306	36,49,446
1104	2,73,453	40,93,457
1105	2,62,182	39,93,457
1106	2,30,600	31,24,080
1107	2,17,370	27,26,357
1108	1,60,507	20,25,950

Year.	Quantity cwts.	Value Rs.
1109	2,02,419	18,70,772
1110	2,51,457	23,78,646
1111	1,96,968	17,83,325

Hides.—

Year.	Quantity Nos.	Value Rs.
1102	2,36,066	2,97,207
1103	4,07,633	3,82,645
1104	and 100 lbs.	3,21,922
1105	3,14,210	2,71,597
1106	2,75,350	2,35,235
1107	3,09,548	2,63,926
1108	3,20,072	3,00,034
1109	3,03,148	2,56,550
1110	3,26,030	3,50,405
1111	4,29,609	5,41,294

Jaggery.—

Year.	Quantity cwts.	Value Rs.
1102	1,13,598	11,35,676
1103	49,428	4,99,283
1104	66,360	6,63,603
1105	41,955	4,19,554
1106	75,131	7,51,314
1107	1,01,871	10,18,710
1108	33,144	3,31,441
1109	52,637	2,65,806
1110	92,699	8,51,214
1111	45,215	2,08,443

Palmyra fibre.

Year.	Quantity cwts.	Value Rs.
1102	16,518	2,61,110
1103	17,470	3,03,993
1104	17,883	3,11,495
1105	12,677	2,64,803
1106	14,619	2,50,419
1107	14,445	2,50,419
1108	11,744	1,95,623
1109	15,044	2,64,227
1110	17,923	2,94,795
1111	19,756	3,14,638

Molasses.

Year.	Quantity cwts.	Value Rs.
1102	39,286	3,49,682
1103	24,404	2,44,045
1104	38,453	3,84,552
1105	35,054	3,50,545
1106	27,617	2,76,116
1107	24,633	2,46,336
1108	22,912	2,29,212
1109	11,582	95,106
1110	39,345	2,46,531
1111	51,086	3,29,354

Sugarcandy.

Year.	Quantity cwts.	Value Rs.
1102	2,710	47,771
1103	12,241	2,54,598
1104	2,615	37,741
1105	5,141	69,993
1106	6,818	91,521
1107	6,974	83,116
1108	15,167	1,98,204
1109	30,636	3,99,953
1110	20,997	2,59,947
1111	23,440	3,19,411

Lemon grass oil.

Year.	Quantity lbs.	Value Rs.
1102	5,32,819	31,64,094
1103	7,86,379	39,31,896
1104	7,93,711	39,68,565
1105	4,79,592	23,97,964
1106	2,81,965	12,73,497
1107	2,80,660	3,68,378
1108	3,05,217	3,81,953
1109	4,47,571	4,63,761
1110	7,43,047	11,34,736
1111	9,77,767	8,59,357

<i>Coffee.</i>		
Year.	Quantity	Value
	lbs.	Rs.
1102	84,689	88,633
1103	2,75,159	2,04,800
1104	1,12,538	93,644
1105	66,966	36,347
1106	5,79,270	3,79,359
1107	75,053	28,074
1108	5,43,284	1,41,225
1109	3,53,928	1,34,617
1110	5,87,335	1,68,202
1111	2,48,080	54,789

Travancore imports several articles. A comparative statement showing the value of imports into Travancore from 1101 to 1110 M. E. Imports. is given in the accompanying table.

Statement showing the value of imports of the principal articles of merchandise for ten years.

Articles.	1101	1102	1103	1104	1105
1. Thread	18,47,458	12,90,656	13,06,159	12,86,217	10,95,752
2. Cotton and piece-goods					
3. Rice	81,61,316	72,89,602	1,56,66,173	1,38,15,703	1,49,82,273
4. Paddy	1,64,41,442	1,30,75,224	2,33,67,425	3,05,15,982	2,23,78,573
5. Tobacco	71,77,489	67,74,894	81,99,475	1,00,56,710	94,22,995
6. Hardware	29,09,849	33,64,026	48,20,632	48,10,093	48,11,140
7. Provisions	14,73,586	17,64,224	17,52,630	22,94,954	12,09,642
8. Machinery and mill work	1,24,937	2,11,864	2,36,789	1,95,274	3,21,002
9. Salt	10,03,696	14,29,713	9,42,005	11,88,951	18,15,718
10. Gingelly oil	7,06,169	3,79,928	4,28,080	3,88,515	2,31,934
11. Glassware	2,35,743	2,60,460	3,21,411	3,51,845	5,11,402
12. Liquors	1,08,275	95,424	63,299	75,353	71,882
Sundries	3,34,001	3,88,128	6,41,300	5,37,312	5,56,708
	1,88,55,902	2,33,83,125	2,46,36,602	2,77,73,772	3,62,01,727
<i>Total</i>	<i>5,93,74,863</i>	<i>6,16,43,268</i>	<i>8,23,81,910</i>	<i>9,32,90,681</i>	<i>9,36,10,748</i>

Statement showing the value of imports of the principal articles of merchandise for ten years.
(Concluded).

Articles.	1106	1107	1108	1109	1110
1. Thread	11,63,472	12,65,205	4,02,082	2,79,250	6,78,195
2. Cotton and piece-goods	75,58,356	74,31,937	89,99,002	72,25,990	55,46,900
3. Rice	1,75,62,343	1,77,16,277	1,54,18,337	1,74,49,351	3,37,94,415
4. Paddy	71,70,712	39,41,406	32,22,323	25,69,277	44,05,153
5. Tobacco	46,41,292	46,03,350	49,54,505	47,32,050	56,68,915
6. Hardware	15,33,777	10,45,543	15,85,943	17,01,833	13,16,860
7. Provisions	6,09,952	3,49,021	6,48,437	4,95,022	3,13,375
8. Machinery and mill work	4,08,543	5,96,363	6,47,386	6,01,191	6,43,982
9. Salt	1,47,305	1,44,091	1,10,466	2,73,591	1,35,752
10. Gingelly oil	3,88,606	4,17,491	4,07,705	2,57,389	1,39,443
11. Glassware	74,076	68,608	3,87,393	4,24,508	1,17,444
12. Liquors	5,34,735	4,89,171	4,27,589	4,79,622	3,74,816
Sundries	3,47,65,728	2,68,61,401	2,71,83,094	2,64,26,976	2,60,16,229
Total	7,65,58,897	6,49,29,804	6,43,99,262	6,29,16,056	6,91,51,279

The State imports necessities as well as luxuries. These include articles the local production of which is insufficient to meet the demand for them and others which are not locally produced at all. The chief items in our imports are paddy and rice.

Paddy and Rice.—Rice is the staple food of the population. We have a vast area under rice. But this area has not kept pace with the increasing population. The State is therefore dependent on imports for her means of subsistence. The imports are chiefly from Burma, China, Siam and British India. The following statement shows the total quantities and values of paddy and rice imported into Travancore during the last ten years.

Year.	Rice.	Value Rs.
	Quantity Tons.	
1102	66,027	1,30,75,224
1103	1,29,633	2,33,67,425
1104	1,68,769	3,05,15,982
1105	1,41,176	2,23,78,573
1106	1,66,853	1,75,62,343
1107	1,83,477	1,77,16,277
1108	1,96,573	1,54,18,337
1109	3,35,611	1,74,49,351
1110	4,22,430	3,37,94,415
1111	3,09,383	2,38,75,057

Year	Paddy.	Value Rs.
	Quantity Tons.	
1102	61,777	67,74,894
1103	73,594	81,99,475
1104	95,506	1,00,56,710
1105	92,924	94,22,295
1106	94,229	71,70,712
1107	62,122	39,41,406
1108	66,520	32,22,323
1109	55,324	25,69,277
1110	66,745	44,05,153
1111	46,271	29,33,153

From the above statements it will be clear that the import of paddy has slightly decreased from 1106, while that of rice has considerably increased. The import of rice has been very high in recent years. This sudden rise in import is not due to the increased demand for consumption through increase in population. The causes are external. Big importing firms have been opened by the Alāyis. They have opened their godowns in all the important ports and have started importing rice in large quantities and in better quality from Burma, Indo-China and Siam. These are made available in plenty in all the consuming centres in the State at cheaper rates than those of the local varieties of rice. Consumers had a prejudice against imported rice formerly owing to its bad smell. But now better quality of rice is being put on the market by the importing firms. Quantity for quantity, the imported rice produces more volume of boiled rice than the local varieties when cooked. This has created an increased demand for the imported variety of rice.

A large portion of the imports from Indo-China, Burma and Siam by sea comes through the Travancore ports. But

during the monsoon the imports are made through Cochin. Besides the imports by sea, certain quantities are brought to Travancore through the land frontiers from Coimbatore, Madura and Tinnevely, in British India districts and from the Cochin State.

A small percentage of the total quantity of paddy and rice imported into the State falls under broken rice. The import of broken rice is steadily deteriorating, since an import duty was levied on the commodity. 93,270 maunds of broken rice to the value of Rs. 2,68,974 was imported in 1111. The import duty has since been taken away. Imports of broken rice are mainly from Burma, Indo-China and Siam. Small quantities of rice bran, rice flour and straw are imported from British India through the land frontiers. Rice bran and straw are from the frontier villages in the Tinnevely district, while rice flour is from Tuticorin. No straw was imported during 1110.

The imports through the ports of Colachel, Trivandrum, Quilon and Alleppey are mainly during the dry months. These ports are practically closed during the monsoons. Imports are more or less uniform throughout the year in the case of the port of Cochin.

The following is a statement of the monthly imports of paddy and rice during the last three years.

Months	1109 (1933-34)		1110 (1934-35)		1111 (1935-36)	
	Rice in 1,000 tons	Paddy in 1,000 tons	Rice in 1,000 tons	Paddy in 1,000 tons	Rice in 1,000 tons	Paddy in 1,000 tons
January	20.9	5.9	16.9	12.7	24.8	10.0
February	22.5	4.9	20.2	6.5	18.7	6.4
March	22.4	10.0	22.3	13.3	20.2	5.6
April	66.0	15.5	20.5	14.9	23.7	7.9
May	26.7	7.8	14.5	2.5	19.3	4.9
June	25.1	1.6	23.5	2.7	25.7	0.8
July	25.8	2.6	11.6	1.2	18.8	1.3
August	14.5	5.1	12.2	1.4	...	...
September	14.4	5.6	18.4	4.1	...	...
October	16.0	7.0	22.9	5.2	...	...
November	18.1	7.0	20.8	6.7	...	...
December	15.0	8.3	20.6	2.4	...	...

The paddy and rice from British India are, as already stated, imported into Travancore through the land frontiers throughout the year. The bulk of the direct import through the four local sea ports arrives only during the importing season, January to May. This is only a small portion of the total import. Supplies of foreign paddy and rice from Burma, Indo-China and Siam come through the port of Cochin. Owing to these reasons, the imports are well distributed throughout the year and there is no marked periodicity. There are, however, slight variations in the quantities of the monthly imports.

The estimated average import of paddy and rice into the State for the years 1100 to 1105 in terms of rice was 1.6 lakhs of tons, while the same for the period 1105—1110 was 2.6 lakhs of tons. This shows that the trend of import is on the increase. In recent years Burma has succeeded in exporting rice of a better quality at considerably low prices. "From the point of view of our rice grower the menace of Burmese competition is not likely to abate in the near

future.....To the paddy cultivators of Travancore Burma is the danger quarter, but to the general consumer that country is the poor man's granary". *

Pulses, Sugar, etc.:— More than for paddy and rice, Travancore depends on outside supply for pulses and sugar. Pulses and black gram are imported both from the adjoining British Indian districts and from Karachi through Cochin. Middlemen play an important part in this trade, as import and distribution are done by individual merchants who are ordinarily supplied by the middlemen outside. The following figures show the import trade in sugar:—

Year.	Sugar.	
	Quantity cwts.	Value Rs.
1102	55,033	9,95,686
1103	67,189	13,77,191
1104	85,501	15,39,558
1105	1,48,757	21,78,401
1106	1,47,795	20,08,849
1107	1,04,738	15,47,733
1108	91,989	11,86,850
1109	1,01,359	14,14,564
1110	66,975	8,62,230
1111	1,07,265	14,04,688

Cotton yarn, piece goods, thread, etc.:— There is not much of direct import of piece goods or yarn from foreign countries. The traders obtain their supplies from Cochin, Bombay, Madras and other places. The import business in cotton goods is largely in the hands of Muhammadan traders from Bombay and Banians from Gujerat. There

* Economic Depression Enquiry Committee Report, Page 46.

are also some Tamilian merchants having business connections in Cochin and Bombay. The small retail trader in the country side buys of these bigger merchants invariably on credit. The statistics relating to the import of piece goods, cotton goods and thread are given below.

Piece goods.	
Year.	Value. Rs.
1102	72,70,373
1103	1,07,05,372
1104	91,45,395
1105	96,90,587
1106	56,71,042
1107	52,42,580
1108	60,20,589
1109 (Duty free)	62,02,389
1110 Do.	39,29,801
1111	67,23,150

Cotton and piece goods (Dutiable).

Year.	Value. Rs.
1109	1,43,032
1110	1,54,945
1111	2,06,275

Cotton goods.	
Year.	Value. Rs.
1102	19,19,229
1103	49,60,801
1104	46,70,308
1105	52,91,686
1106	18,87,314
1107	21,89,357
1108	29,78,413
1109	8,80,569 (Duty free)
1110	14,61,954 (Do.)
1111	24,40,870

Year.	Thread.	Value Rs.
1102		12,90,656
1103		13,06,159
1104		12,86,217
1105		12,65,205
1106		4,02,082
1107		12,65,205
1108		4,02,082
1109		2,79,256
1110		6,78,795
1111		6,20,626

Besides, the State imports several other articles the aggregate figures of which have been given in the comparative statement of imports supra.

So far we have been dealing with the external trade of the State. The internal trade is conducted by petty traders and middlemen, who pass on the articles they purchase to the exporting centres. Generally they stock goods. The rural retail trader depends almost entirely on the credit allowed to him by the urban traders. Ordinarily, the rural shop-keeper or the petty dealer who runs a provision store supplies the requirements of his customers in the neighbourhood. Retail prices are always high because trade is often done on credit. The prices should therefore be such as to cover interest and losses on bad custom. The customers make payments in instalments from the sale proceeds of their produce as coconut, pepper, etc. This credit system that dominates rural trade is highly detrimental to the retail buyer. Internal trade consists mainly of necessities and occasionally luxuries of life. Formerly there was a system

of levying inland customs duty when an article was taken from the jurisdiction of one chowkey to another. That was abolished in 1012 M. E.

The medium of commerce may now be stated. Travancore has its own coinage of the silver fanam (2·25 annas), the copper chuckram (6·74 pies) and the copper cash (0·42 pie). It has been minting its own silver half rupee (14 chuckrams) and quarter rupee (7 chuckrams). The British Indian Rupee and currency notes are also in free circulation.

Weights and measures:—The weights and measures current in Travancore are given below:—

TABLE I.

English lineal measure.

12 inches.	=	1 foot.
3 feet	=	1 yard (standard measure of length in Travancore).
22 yards	=	1 Gunter's chain=100 links.
220 yards	=	1 furlong.
8 furlongs	=	1 mile.

TABLE II.

Measure of length in Travancore.

1½ inches	=	1 angulam.
24 angulams	=	1 kōle.
4 kōles	=	1 danḍu = 3½ yards.

TABLE III.

English square measure.

144 square inches	=	1 square foot.
9 sq. feet	=	1 sq. yard.
$48\frac{2}{3}$ sq. yards	=	1 cent.
10 cents	=	1 sq. chain.
10 sq. chains or		
100 cents	=	1 acre.
640 acres	=	1 sq. mile.

TABLE IV.

Measure of area in Travancore.

16 square kōles	=	1 square dandū.
$434\frac{3}{5}$ sq. dandūs	=	1 acre.

TABLE V.

English cubic measure.

1,728 cubic inches	=	1 cubic foot.
27 cubic feet	=	1 cubic yard.

TABLE VI.

Measure of solidity in Travancore.

24 cubic viñals	=	1 peṛukkam.
24 peṛukkams	=	1 thūvaḍa.
24 thūvaḍas or		
one cubic kōle	=	1 candy = $15\frac{5}{8}$ c. ft.

TABLE VII.

English Troy weight (used in weighing gold, silver,
diamonds and other costly articles.)

4 grains	=	1 carat.
6 carats	=	1 dwt. (penny weight).
20 dwts.	=	1 oz. (ounce).
12 ozs.	=	1 lb. (pound).

TABLE VIII.

English Avoirdupois weight (used in weighing
bulky articles of commerce).

16 drams	=	1 ounce.
16 ounces	=	1 lb. = $38\frac{8}{9}$ tōlas.
28 lbs.	=	1 quarter.
4 quarters	=	1 cwt. (hundred weight).
20 cwts.	=	1 ton.

TABLE IX.

Weights used for weighing opium, ganja, salt, etc.

80 tōlas	=	1 seer.
40 seers	=	1 maund.

TABLE X.

Weights used in Travancore for weighing
gold and silver.

$5\frac{5}{8}$ grains Troy	=	1 paṇaviḍa.
$13\frac{1}{8}$ paṇaviḍas	=	1 kaḷanchu.
21 paṇaviḍas	=	1 sovereign weight.
$30\frac{1}{2}$ paṇaviḍas	=	1 tōla (standard weight in Travancore),

TABLE XI.

**Weights used in Travancore for weighing copper,
iron, pepper, sugar, tobacco, etc.**

$5\frac{3}{5}$ tōlas	=	1 palam.
$7\frac{1}{2}$ palams	=	1 rāṭhel.
100 palams or		
$13\frac{1}{3}$ rāṭhels	=	1 thulām.

TABLE XII.

Dry measure used in Nanjanad.

2 āḷakkūs	=	1 oḷakku.
4 oḷakkūs	=	1 paḍi.
8 paḍies	=	8 maṛakkāl = 4·11 eḍangalīs.

TABLE XII A.

Dry measure used in the Devikulam taluk.

Paḍi	=	$1\frac{1}{4}$ eḍangalī.
------	---	--------------------------

TABLE XII B. (Shenkōṭṭa)

Paḍi	=	$1\frac{1}{4}$ eḍangalīs.
Maṛakkāl	=	4 paḍis.

TABLE XIII.

Dry measure used in other places.

2 oḷakkūs	=	1 urī.
2 urīs	=	1 nēḷi.
4 nēḷis	=	1 eḍangalī (standard measure of capacity in Travancore).
10 eḍangalīs	=	1 para.

TABLE XIV.

Liquid measure.

4 thavis or thudams	=	1 nāli.
4 nālis	=	1 edangali (standard measure of capacity in Travancore).
10 edangalis	=	1 para.

TABLE XV.

Measure of country liquor.

6 drams	=	1 imperial pint.
2 imperial pints	=	1 imperial quart.
4 imperial quarts	=	1 imperial gallon (3·465 edangalis).

BIBLIOGRAPHY.

Padmanābha Mēnon, K. P.

Panikkar, K. M.

Commercial Review.

Government of Travancore.

„

„

„

„

„

History of Kēraḷa.

Malabar and the Portuguese.

Malabār and the Dutch.

1935, 1936, and 1937 Volumes.

Administration Reports 1930-1935.

Statistics Vols. I to XVIII.

Banking Enquiry Committee Reports, Vols. I and II.

Economic Depression Enquiry Committee Report.

Regulations and Proclamations.

Administration Reports of the Excise

Department from the beginning to

1111 M. E.

CHAPTER XXIV

INVESTMENT AND CREDIT

The earliest medium of credit was the indigenous banker. Indigenous bank means all banks and bankers, other than the Imperial Bank of India, the *Indigenous banker.* exchange banks, joint stock banks and co-operative societies.* It also includes any individual or private firm, whether receiving deposits or not and dealing in hundis or lending money.

There are two classes of indigenous banks in the State. One confines its activity to money lending and does not ordinarily take in deposits, while the other, besides lending money, takes in deposits and does a lot of business in money changing. In common parlance both these style themselves as bankers. The first are known as money lenders and the second as hundi merchants.

Hundi merchants:—Ordinarily these are Tinnevely Brahmans who claim to be intermediaries in the trade relation of Travancore and British India. From very early times, there have been close business relations between Travancore and the neighbouring Tinnevely district. The origin of the hundi business in Travancore may be traced to the beginning of the nineteenth century. There are hundi merchants in all important trading centres in the State. It was estimated by the Banking Enquiry Committee (1932) that in that year there were more than 22 hundi merchants in the State, that nearly 15 lakhs of rupees had been invested as capital in their business and that their volume of business exceeded a crore of rupees. The bulk of this

* Definition by the Travancore Banking Enquiry Committee.

business is run as family concerns, the eldest male member being in management. There are also firms. Some of these are engaged in other kinds of business as well, the principal one, however, being banking. The hundi merchants finance to some extent the internal trade of the country. The smaller industrial concerns too receive occasional accommodation.

The hundi merchants receive depositors on a system called *pattuvaravu* which may be described as current accounts. The interest is calculated on the daily balance. No distinction is made between current accounts and fixed deposits. They issue letters of credit or *mēle'ut'hu*, as they are called, and deal in hundi which may differently be described as an inland bill of exchange or sight draft. Depositors are given a pass book in which receipts and withdrawals are noted. They follow a system of chits in the place of cheques. For payments directly made to them they do not give any receipt. The remitter gets the entry certified in his book in his presence. For payments made to residents in other places, formal receipts are given. They also advance loans on pro-notes on single or joint signatures. Pro-notes are invariably taken by the lenders. The interest varies from 12 to 24 per cent. The accounts are written in Tamil.

The hundi merchants monopolised the business and controlled credit before the advent of the Bank of Madras. Failures are frequent. Mismanagement, fraud, law's delays and the capital getting locked up in landed property as the last resource, are found to be the commonest causes of their failure. The hundi merchants still exercise a good deal of influence over the trade of the country. The cheaper rate of interest and the greater remittance facilities provided for by the Imperial Bank (then the Bank of Madras) limited the scope of their business to a very great extent. The joint stock banks became their competitors as both had practically the same class of clients. Added to these, the

inadequacy of their finance, combined with the absence of an institution for accommodation during a period of imperative calls, has checked their growth to a considerable extent.

Money lenders:— The money lenders, however, continue to exercise by far the greatest influence in financing agriculture. The Travancore Banking Enquiry Committee found that there were 264 prominent money lenders at that time. They do business mostly in agricultural centres, like Nājanād and Kuṭṭanād and also at those places where there are no joint stock banks. Seventy five per cent. of the financing of agriculture in Kuṭṭanād is in the hands of the Brahman money lenders of Mankompu. These people lend not only money but also paddy. The rate of interest varies from 6 to 12 per cent. on money and 10 to 20 per cent. on paddy. The bulk of the loans is unsecured. The loan is generally for a single year. The money lenders of Mankompu are big owners. There are numerous small money lenders too in both urban and rural areas. Their transactions are generally with smaller cultivators and traders. They generally levy much higher rates of interest, but seldom finance trade. Both classes lend only on valuable security. The rural money lender is the more important of the two as his transactions cover a wider range. With the growth of joint stock and co-operative banks, the number of money lenders operating individually is dwindling.

The most popular institution both for investment and credit is the chitty. It is a very ancient institution. The

antiquity of chitty is spoken to by Mr.

Chitties.

Logan in his Manual of the Malabar district

and by Mr. Sim Cox in his Primitive Civilisations. A chitty is a transaction by which one or more persons enter into an agreement with a number of persons that every one of the contracting parties shall subscribe a certain amount of money or quantity of grain by periodical

instalments for a certain definite period, and that each in his turn, as determined by lot or auction, or in such other manner as is provided for in the *vaṭṭyāla* (rules), shall be entitled to the prize amount.

There are two main classes of chitties:—

1. Narukku chitty, and
2. lēla chitty (auction chit).

In the narukku chitty the amount that a subscriber gets is determined by lot. A certain percentage of the capital is set apart as the foreman's (the person who conducts the chitty) commission. Another portion, usually 12 per cent., is deducted from the prize amount by way of interest and rateably distributed among the remaining subscribers. This kind of chitty is not so popular as the lēla chitty.

There are two kinds of lēla chitty. The common feature of both is that the chitty amount or total collection at each instalment is put to open auction. The subscriber who offers to pay the highest discount for the advance gets the prize. In one type the amount deducted is distributed among non-prized subscribers only, while in the other the amount is distributed among all the subscribers. All chitties have now to be registered at the office of the Registrar of Chitties, under Regulation III of 1094, except those with less than a capital of Rs. 100. The chitty is really a good form of banking concern both for saving and for affording facilities for investments and loans. The number of chitties working in 1111 was 6,228 and their total capital amounted to Rs. 86 lakhs.

The following statement shows the number of chitties registered in each year, the number of chitties working at the end of each year and their total capital.

Year.	No. of chitties registered each year.	No. of chitties working at the end of each year.	Total capital Rs. (in lakhs).
1104	1,625	9,931	236
1105	1,388	10,735	247
1106	524	10,289	258
1107	294	9,254	262
1108	284	8,418	265
1109	339	7,667	146
1110	272	6,944	125
1111	35	6,228	86

The fall is due to the economic depression.

Investment of money can be made with money lenders, hundi merchants and in chitties. In addition to these, the following institutions afford facilities to the public for investment in Travancore.

Institutions for investment.

(1) *Savings Bank*:—Savings Bank business is conducted in all important treasuries and 170 Anchal Offices. Besides ordinary accounts open to the public, security accounts are also allowed in favour of government servants who have to furnish security for their posts. Public accounts are permitted in these Savings Banks in the case of municipalities, co-operative societies and other public bodies and institutions conducted for purposes other than the personal advantage of the contributors. Fixed deposit accounts are generally allowed in the case of municipalities and dēvaswoms having personal deposit accounts in the treasuries.

(2) *Postal Savings Bank*:—Any person can deposit money in a Post Office Savings Bank on his own behalf or on behalf of any minor relative or of any minor of whom he is the guardian. The smallest sum that can be deposited

at any time is annas four, but fraction of an anna is not allowed.

The total amount at call which a depositor can have at any time exclusive of interest for the current year is Rs. 5,000 in the case of an adult and Rs. 1,000 in the case of an account opened on behalf of a minor by his relative or guardian. A depositor can withdraw money only once a week. Accounts are transferable to any part of India. Post Office Savings Bank also affords facilities for investment.

3. *Post cash certificates* :— These certificates are becoming popular. They are available from any Post Office in the State.

4. *Treasury savings banks* :—The Travancore State treasuries do savings bank business mostly for the purpose of security and public accounts.

5. *Co-operative societies* :—These societies encourage thrift by compulsory deposit schemes.

6. *Joint stock banks* :—These institutions have invariably a savings bank branch where they receive deposits.

7. Investors can also purchase Government of India and Government of Travancore Promissory Notes.

8. *Insurance* :—A good number of insurance companies, all of foreign incorporation (except the Co-operative Insurance Society), are working in Travancore. A large part of the savings of the middle class is invested in these companies.

9. *The State Life Insurance* :— The State Life Insurance has two branches, the government servants' branch and the public branch. Government servants in the permanent pensionable service of the State and those of the funds whose services are pensionable from the general revenue are eligible for insurance in the branch. Insurance is compulsory in the case of those entertained in Government Service on or after the 1st Minam 1107, who have not joined the State Provident Fund. The administrative control of the Fund vests in the Chief Account Officer. Policies to the

value of Rs. 4,41,805 had been issued up to the end of the year 1111.

The public branch of the insurance scheme is intended for the benefit of the general public. It was started in Minam 1109. The benefit of the scheme is confined to Travancoreans by birth or by domicile. The Chief Account Officer administers the branch. The value of policies issued till the close of 1111 M. E. was Rs. 19·18 lakhs. This branch is becoming increasingly popular.

There are 252 registered banking institutions in Travancore. The most prominent of these is the Imperial Bank of India, a banking corporation incorporated in British India, working through its branches in Travancore. There are branches of the Imperial Bank of India, one at Alleppey and the other at Trivandrum, and there is an out-station of the bank at Quilon. The Trivandrum branch confines its operation mainly to the treasury work of the Government of Travancore. The working of the Imperial Bank in the State is governed by the Imperial Bank of India Act of 1920 which has been recognised by a Proclamation issued by His Highness the Mahārāja, and its relations with the Travancore Government are governed by an agreement entered into with the bank. The Government maintains a minimum balance of Rs. 2·5 lakhs with the Trivandrum Branch upon which no interest is paid by the bank and this sum is exclusive of any cash balance in current accounts on which an interest of 2 per cent. is allowed on the daily balance if the amount exceeds Rs. 1 lakh. The bank will receive money to the credit of the Government if required. Cheques, bills, credit notes and other orders payable at the bank at its Head Office in Madras or branches within the Madras Circle are to be realised and credited at par and intimated to the Trivandrum Branch of the bank.

The bank receives fixed deposits and current accounts. It discounts trade bills. Advances are made against produce

and gold security. Cash credits and overdrafts are allowed to a limited extent. The rate of interest charged is 1 to 2 per cent. above the Madras rate subject to a maximum 6 per cent. From the nature of its constitution and owing to its conservative policy it has been of use to the Indian trading classes only to a limited extent.

Besides the Imperial Bank, there are five* other banks incorporated outside which are working through their branches in Travancore. These are the Indian Bank, Ltd., the Nedungāḍi Bank, Ltd., the South Indian Bank, Ltd., the Canara Bank Ltd. and the Suburban Bank, Ltd. The Indian Bank has its branch at Alleppey, the South India Bank at Trivandrum, the Canara Bank at Alleppey and the Suburban Bank at Kaḍanād. The Nedungāḍi Bank has got three branches, two at Trivandrum and the other at Alleppey. Some of these banks finance local trade to a very limited extent.

Of the Travancore banks, one is a Nidhi. The joint stock banks of Travancore are of comparatively recent origin. For three decades from 1888 we had, with five exceptions, what were called Ēla Nidhis. These institutions were ephemeral and were started for all manner of financial purposes. They were governed by the Companies Regulation I of 1063 M. E. (1888). All these institutions gradually died out except one, viz., the Travancore Permanent Fund, Ltd. The Travancore Permanent Fund which was registered in 1074 had at first the whole State as the area of its operations. Its activities were later on confined to the town of Trivandrum and its name changed into the Trivandrum Permanent Fund, Ltd. It has Rs. 13,80,000 as its authorised capital, Rs. 8,21,931 as its subscribed capital and Rs. 3,10,891 as its paid up capital. A branch has been started at Nāgercōil.

* Recently a branch of the Central Bank of India has been opened at Alleppey.

When the new Companies Regulation of 1092 came into force, four banking institutions registered in Travancore were doing business. They were:—

1. The Changanassery Banking Company, Ltd.
2. The Malabar Family Assistance Company, Ltd.
3. The Travancore National Bank, Ltd.
4. The Ammalapula Christian Bank, Ltd.

Two of these are doing business to-day. The Malabar Family Assistance Company, Ltd., was wound up and the Travancore National Bank with which the Quilon Bank was amalgamated is now in liquidation.

The growth of joint stock banks in Travancore is phenomenal. Their rapid development began in 1919. In 1092 M. E. (1916-17) the total number of banking institutions doing actual business was only six. The increase in their number was as shown below:—

1092	6
1093	5
1094	8
1095	35
1096	43
1097	41
1098	38
1099	36
1100	36
1101	44
1102	57

The next four years showed a phenomenal increase in the number of joint stock banks. There was a rapid rise from 195 in 1194 to 256 in 1105, and to 270 in 1106, followed, however, by a gradual decline in the enthusiasm for the registration of banking concerns since 1106,

consequent on the economic depression in 1105 and the craze for the registration of Provident Insurance Societies. Of the 252 banking institutions working in 1110 only the following seven banks had a paid up share capital of above Rs. 1 lakh.

1. The Travancore State Aided Bank, Ltd.
2. The Travancore National Bank, Ltd.*
3. The Quilon Bank, Ltd.*
4. The Travancore Commercial Bank, Ltd.
5. The Travancore Union Bank, Ltd.
6. The Travancore People's Bank, Ltd.
7. The Pālāi Central Bank, Ltd.

These banks have opened branches both in and outside the State. Though the banking institutions are spread throughout the State, the Trivandrum taluk stands first in the number of working institutions and new registrations. Ampalapūla and Thiruvalla come next. These banks finance trade, agriculture and to some extent small industries. They do not play any appreciable part in the commerce of the country. The reserve funds of these banking institutions are almost nil and the proportion of cash balance almost negligible. Barring the above institutions which have by the volume of their transactions and circulating capital reached an appreciable standard in the banking world, all others lend at 15 to 24 per cent. interest on pro-notes and joint signatures and gold and landed security. The Travancore National and Quilon Bank had the highest paid up capital. The State Aided Bank of Travancore ranks the second, the Travancore Commercial Bank comes the 3rd and the Pālāi Central Bank the 4th. The lowest paid up capital is Rs. 400 and there are six banks which have no paid up capital at all. During the last ten years several banks have failed. A very remarkable feature

* Since amalgamated into the Travancore National & Quilon Bank Ltd. now in liquidation.

is that almost all these banks are conducting chitties. Soon after registration almost every bank starts a chitty with the object of attracting deposits. The bank's business is offered as security. Loans are advanced to non-prized subscribers of the chitty on the security of the subscriptions paid by them against the prize amount paid to the winner. Land is accepted as collateral security as in the case of most of the subscribers land is the only form of security that they can offer. Ultimately the funds of the bank get locked up with the chitty. Not infrequently, in order to keep a previous chitty going, a second or a third chitty is started. The institution of chitty is an impediment to the growth of true banking and results in serious irregularities.

The rate of interest continues to be high. It mounts up to 18 per cent. per annum and sometimes even more. The existence of the Imperial, the Indian and the State Aided Banks, which advance money at lower rates of interest, has not in any way affected the rate of interest demanded by the local joint stock banks. The real reason for this is that the majority of the local joint stock banks with their present method of business cannot attract sufficient capital to meet the requirements of the public. The banks have to pay high dividends. They must therefore have large deposits and business turn over or the only alternative is to demand excessive rates of interest.

The origin of the State Aided Bank of Travancore and the circumstances that led to its inception demand a short review here. In 1918 and 1919 representations were made in the Sri Mūlam Popular Assembly that trade was suffering for want of adequate banking facilities and that the branch of the Bank of Madras at Alleppey was not very useful to the generality of traders. The suggestion was that a State Bank or one with State aid would improve the situation.

The State
Aided Bank.

The Government favoured the idea of helping the creation of a State Aided Bank and deputed one of the Assistant Account Officers of the State to Baroda and Mysore to acquaint himself with the working of similar banks in those States and submit his recommendations. It may be noted that there was remarkable private enterprise in banking at that time. The officer referred to submitted his report in 1101 M. E. The State Aided Bank of Travancore was established at Alleppey. It was intended almost entirely as a commercial bank to carry on the business of banking in all its branches and departments. It was at liberty to accept immovable property as collateral security in addition to any other authorised security. The bank cannot make any loan or advance for any period longer than six months, but may advance on personal security up to a maximum period of six months. One of the objects in establishing the bank is to finance the middle class merchants and the small borrowers who do not get sufficient accommodation from the existing branches of the Imperial Bank. The bank enjoyed certain concessions from the State.

But in spite of the [concesssions and privileges and the high expectations with which the bank was started it resulted in a big disappointment. Its activities did not disclose any substantial facilities of finance having been afforded to the country in the mannner and to the extent expected of it. Its presence did not reduce the rate of interest nor produced any influence on banking by stabilising other banks or raising their standard of efficiency. The promise of the State Aided Bank to use the available balance of treasury for productive purposes and to act as the banker's bank and clearing house for the several joint stock banks, or again, its ability to lend money to well established co-operative organisations did not materialise. The Government was therefore obliged to withdraw its support from the bank.

In 1107 the Government attempted to solve the problem of long term credit by the establishment of a State Land Mortgage Bank. Loans were issued from the bank only for the liquidation of prior debts charged on immovable property in the possession of the borrower. The bank was a government concern and its accounts were kept distinct from the State accounts. Besides the donation of Rs. 1 lakh made by His Highness the Mahārāja, which served the bank as initial capital, the bank's working capital was drawn from advances from the Government for which the bank paid interest. The rate of interest charged on advances from the Government was 4¹ per cent. per annum and that on loans advanced by the bank 6½ per cent. per annum. The maximum limit for a loan from the bank was Rs. 5,000 and the minimum Rs. 250. The loans were repayable in yearly or half yearly instalments in periods ranging from a minimum of five to a maximum of twenty five years.

In addition to this, the State began to work out a programme of redemption of agricultural indebtedness by means of Debt Conciliation Boards. The Agriculturist's Debt Relief Regulation was passed for this purpose.

But it was felt that these credit institutions were not adequate to meet the demands of the people. The several joint stock banks in the State were working without any mutual understanding whatever and were doing business each for itself with the result that in spite of the large number of banks the public were not properly served. The source of finance remained to be properly tapped. Trade and industry were suffering from want of finance. It was truly realised that "what was lacking in Travancore was a central banking and financial authority which would co-operate with the banking and treasury facilities, reinforce credit in the State, would actively, though prudently, stimulate industrial growth and be at the back of the internal and export trade".

A shareholder's bank called the Travancore Credit Bank was therefore constituted for the purpose mainly of granting long term loans with a view to benefit agriculture and industry in the State. The bank was constituted under the Travancore Credit Bank Regulation IV of 1113. It was formally declared open on the 6th Mēḍam 1113.

Transmission of money between these institutions of investment and credit is done by hundi merchants, joint stock banks, the British Post Office, the Remittance facilities. State Anchal Office and the Government treasuries. The rates charged vary. The indigenous credit instrument used for exchange transactions is the hundi. Hundies were introduced by the hundi merchants and copied by private bankers and joint stock banks. There are three forms of hundis, viz., (1) The *Darśana* Hundi used merely for the remittance of money from one place to another, (2) the *Vasūl* Hundi used for the collection of funds due to a trader, and (3) the *Mēleḷuṭhu* or the letter of credit.

The Gujerati traders in Alleppey introduced the Havala remittance system. It is drawn as a bill of exchange made payable on demand. But actually payment falls due only within seven to twelve days, the date on which it is to be retired being noted at the corner of the paper folded over.

The other methods that are prevalent are the cheque system and the railway receipt system. The railway receipts are employed to collect the price of commodities transported through the railway. Usually the railway receipts are sent by value payable post to the consignee, the parcels being addressed either to self or the consignee himself. The railway receipts are also employed as instruments to support credit.

These relate to remittances outside the State. Remittances within the State are made by means of money orders anchal-insurance, bankers' drafts, supply-bills and remittance transfer receipts.

An important part is played by co-operative societies and banks in the credit system of the State.

BIBLIOGRAPHY

- | | |
|---|---------------------------|
| The Central Banking Enquiry Committee's Report. | Government of India. |
| The Banking Enquiry Committee's Report. | Government of Travancore. |
| Regulations and Proclamations. | Government of Travancore. |
| Administration Reports from 1080 to 1111. | Government of Travancore. |
| Statistics, Vols. I to XVIII. | Government of Travancore. |

CHAPTER XXV

JOINT STOCK COMPANIES AND CO-OPERATIVE SOCIETIES.

JOINT STOCK COMPANIES.

A large portion of the trade of the country is run by commercial corporations registered under company law. The necessity for legalising the incorporation, regulation and winding up of trading companies and other associations arose in Travancore in 1063 M. E. The immediate necessity arose out of the formation of a joint stock company to set up a paper mill at Punalur to utilise a great deal of raw material which was being wasted. Incidentally it was thought necessary to encourage the combination of capital and skill in industrial and other undertakings which were too much for the individual. Regulation I of 1063 was therefore passed to enable the promotion of joint stock enterprise. The Regulation merely enacted that the Indian Companies Act of 1882, as amended by Act VI of 1887, shall *mutatis mutandis* come into force throughout Travancore. The Indian Companies Act thus adopted was also published for general information. The above Regulation was repealed by the existing Regulation of 1092, as the provisions of the earlier Regulation were found insufficient to meet the present requirements. This was followed by a boom in company formations. The general characteristics and chief results of the joint stock organisations have been :—

1. The increased ability of people with relatively small means to take part in production, their capital being as a rule used to greater advantage than if left in their hands;
2. the growth in the size and scope of business undertakings ;
3. the division of functions and of capital ownership and control leading to a strong impersonal element in industrial organisations ; and

4. the increased economic powers due to large capital control.

Since the passing of the Regulation the number of corporations has steadily increased. In the year 1111 there were 451 registered companies in Travancore. The companies which were limited by shares were classified as shown below :--

1. Banking and loan.	244
2. Nidhis and chit associations.	1
3. Insurance.	26
4. Motor traction, dealing and manufacture.	6
5. Others (Transit & transport).	1
6. Mutual trading associations.	4
7. Printing, publishing and stationery.	13
8. Engineering.	4
9. Public Service.	1
10. Clay, stone, cement, lime and other building and constructing materials.	5
11. Agencies.	1
12. Other trading and manufacturing concerns.	38
13. Cotton mill.	1
14. Paper mill.	1
15. Rice mill.	1
16. Oil mill	1
17. Tea planting companies.	13
18. Rubber planting companies.	15
19. Other planting companies.	10
20. Sugar company.	1
21. Companies other than those specified above.	3

These 390 companies had an authorised capital of Rs. 9,17,51,861, a subscribed capital of Rs. 3,29,44,826 and a paid up share capital of Rs. 1,87,58,898. Besides these there were 25 companies limited by guarantee having no capital. They had 830 members. The following statement shows the figures relating to joint stock concerns in Travancore for ten years from 1102 to 1111 M. E.

Table showing the number of joint stock companies from 1102.

Year	1		2	3	4	5	6	7	8	9	
	Banking, loan & insurance										
	Banking and loan	Nidhis Insurance									
1102	56	1	...	5	40	5	44	1	...	1	3
1103	119	1	...	5	48	3	43	1	...	1	3
1104	194	1	...	6	54	3	47	1	1	6	1
1105	255	1	1	7	62	4	37	1	3	9	1
1106	269	1	13	7	65	4	37	1	5	11	1
1107	267	1	261	9	65	5	37	1	6	19	1
1108	274	1	509	10	78	6	38	1	6	19	1
4109	266	1	239	9	64	6	35	1	6	18	1
1110	251	1	46	8	70	4	39	1	3	21	2
1111	244	1	26	7	66	4	38	1	...	25	3

Besides these there are a few institutions which are working within the State though incorporated outside. The following list gives their details.

Type.	No.	Where incorporated.
Banks.	7	British India.
Insurance.	10	England.
Do.	3	Australia.
Do.	1	Switzerland.
Do.	6	British India.
Navigation.	2	England.
Railway.	1	Do.
Motor, traction, etc.	2	British India.
Printing, publishing.	1	England.
Trading.	6	Do.
Do.	1	Scotland.
Do.	1	U. S. A.
Do.	2	Holland.
Do.	11	British India.
Tea.	6	England.
Do.	3	Scotland.
Do.	2	British India.
Do.	1	Colombo.
Rubber.	5	England.
Do.	2	Scotland.
Do.	4	Colombo.
Mining and quarrying.	2	England.

The statistical statement will show that there has been an abnormal increase in the number of provident insurance companies from 1107. These insurance companies did not transact insurance business on usual lines, insuring lives on medical certificates. They were mostly benefit funds offering to pay bonus on the happening of certain contingencies, calls being made thereupon on subscribers. They were known as free or dividing insurance companies for the reason that insurance was done freely without medical examination and the collections were divided among the claimants. The chief reason for the sudden and large

activity in such insurance business was that there was no profit and therefore no inducement to form companies for trading or planting purposes or for starting industrial concerns owing to economic depression and financial stringency, while for starting insurance companies of the kind little or no capital was required. The Government thought that these companies were unreasonably exploiting the credulity of the poor masses and that it was therefore necessary to regulate the growth of this unhealthy speculation. Steps were taken to control the operation of such associations by legislation and to deal effectively with those which were clearly fraudulent and insolvent. Regulation III of 1108 was passed to safeguard the interests of the public against the fraudulent intentions of those who floated these banking insurance companies. Under the aforesaid Regulation an initial deposit with the Government of a sum of Rs. 5,000 was made a condition precedent for any insurance company to be registered after the 1st Kumbham 1108, while for such companies already in existence a similar deposit had to be made within six months from the above date. The fact that out of the total number of 509 provident insurance companies registered under the Companies Regulation, only twenty three made the full initial deposit of Rs. 5,000 each and that of these only fifteen applied for registration under Regulation III of 1108 is clearly an index of the extent to which the new Regulation dealt a blow on the mushroom growth of these provident insurance institutions. There was a regular fall in the total number of provident insurance companies next year since a large number of insurance companies either went into liquidation or became defunct during the year owing to their inability to furnish the initial security deposit under Regulation III of 1108. Out of 514 provident insurance companies registered between 1105 and 1108 only forty six companies were working in 1110, the rest having ceased to function.

The following statement shows an abstract of the working of joint stock concerns from 1102.

Abstract of joint stock companies from 1102 M. E.

Year	No. of Companies	Companies limited by shares			Companies limited by guarantee and having no capital	
		Authorised	Capital Subscribed	Paid up	No. of Companies	No of Members
1102	152	4,53,85,050	1,32,05,433	84,81,341	...	...
1103	221	5,80,57,550	1,97,28,135	1,14,53,924	...	...
1104	308	7,10,24,000	2,29,92,190	1,27,14,840	...	...
1105	372	8,20,76,661	2,79,68,760	1,57,54,658	0	604
1106	403	8,61,62,661	2,91,44,612	1,65,54,864	11	644
1107	653	9,16,94,662	3,02,12,990	1,76,05,431	19	773
1108	924	9,92,31,062	3,23,08,066	1,90,01,008	24	837
1109	641	9,53,39,662	3,12,88,352	1,83,30,295	24	1,012
1110	425	9,05,83,662	3,23,15,157	1,94,46,905	22	884
1111	390	9,17,51,861	3,29,44,826	1,87,58,898	25	860

Chambers of Commerce.—The trading corporations have joined together to safeguard their interests and formed Chambers of Commerce. The Chamber of Commerce is a very recent institution in Travancore. There are four Chambers now, the Travancore Chamber of Commerce, the Alleppey Chamber of Commerce, the South Travancore Chamber of Commerce and the Trivandrum Chamber of Commerce. These are non-official organisations which are ready to advise the Government on the policies to be pursued in commercial matters. They take a keen interest in the legislation affecting the commercial community. They investigate the complaints regarding commerce and endeavour to remove trade hindrances, anomalies and disabilities. They collect and collaborate trade statistics and information. The Travancore Chamber of Commerce, the registered offices of which are at Alleppey, was inaugurated in 1928 by Mr. M. E. Watts, Dewan of Travancore. Its membership is open to Indian and European firms or individuals alike and it has been found that the interests of both the communities were almost identical, enabling the work of the Chamber to progress in a pleasant atmosphere of co-operation and good-will. Besides such services as measuring cargo, conducting surveys and arbitration, the Chamber of Commerce publishes the usual prices current, clearance reports of steamers and monthly statements of exports and imports, and is always prepared to furnish all available information and render every assistance in respect of matters relating to the commerce of the country. The Chamber has entered into close and friendly touch with similar institutions abroad with a view to gathering information useful to the mercantile community in Travancore and widening its activities in the interests of the country as a whole.

The Alleppey Chamber of Commerce was started in 1929. It represents the Indian merchant community in

Alleppey. It runs a Commercial Review and has entered on a fresh sphere of working.

The South Travancore Chamber of Commerce was started in January 1935 for safeguarding the interests of the commercial community of South Travancore. The Trivandrum Chamber of Commerce belongs to the Indian Trading Community of Trivandrum.

CO-OPERATIVE SOCIETIES.

The co-operative movement in Travancore, as in other parts of India, is due to the initiative taken by the Government. The Co-operative Societies

Co-operation. Regulation was passed in 1089 M. E. It received its impetus from the then Dewan of the State, Sir P. Rājagōpālāchārī, who was the first Registrar of Co-operative Societies in the Madras Presidency. The Regulation was based on the Co-operative Societies Act II of 1912 of British India. The object of the Regulation was to facilitate the formation of societies for the promotion of thrift and self-help among agriculturists, artisans and persons of limited means, and, for that purpose, to provide for the constitution and control of co-operative societies.

It was at first apprehended that "in Travancore the majority of whose population follows a law of inheritance which does not command or afford facilities for individual credit, the movement cannot be expected to show signs of rapid growth". But in spite of such impediments, the movement made substantial progress. The financing of the societies was left to the Central Co-operative Bank with its office at the capital. The membership in the bank was opened not entirely to societies but also to individuals. The Central Co-operative Bank, which was the first co-operative society in Travancore, was registered on the 23rd November 1915 (8th Vrischikam 1091) with a subscribed capital of one lakh

Progress of the
movement.

of rupees consisting of a thousand shares of Rs. 100 each. Five hundred shares were reserved for primary societies. The main objects mentioned in its bye-laws were to finance the primary societies when they came into existence, to serve as a balancing centre for the surplus funds of its constituent members and to grant cash credit along with loans to affiliated societies. The management was in the hands of the individual members to start with, but provision was made in the bye-laws for securing the majority on the managing board to the representatives of the share-holding societies when they exceeded a fixed number. The Government advanced to the Central Bank a sum of Rs. 50,000 repayable in four yearly instalments.

Before the end of the first year of the inauguration of the movement twenty five primary societies were registered. Eighteen of them were agricultural credit societies, three non-agricultural credit societies and four distributive societies. The credit societies were first organised on the basis of the Raiffeisen type with nominal share capital, unlimited liability and indivisible profits. These societies were not popular. The inability of the Central Bank to render financial aid to the societies, combined with the apathy of the latter to build up their own working capital by attracting deposits, compelled the department to modify its policy after about three years. The share capital system was then introduced with provision to pay the share capital in easy instalments. With the growth of paid up share capital the demand for dividend also became pronounced. The indivisibility of profits which was the necessary concomitant of societies with unlimited liability basis of the orthodox type had therefore to be given up. Limited liability societies were therefore allowed even in rural areas in spite of the provision in the law that credit societies in which agriculturists preponderated should be unlimited in liability. But after a few years the law laying down unlimited liability was strictly enforced, and no

society in which agriculturists preponderated was allowed to be registered on the limited liability basis. The share capital was regarded as the basis for issuing loans to members notwithstanding the unlimited liability character of a society.

Another feature in the development of the movement in the earlier stages was that societies were largely registered for separate communities, because in the beginning there was a strong predilection for exclusive communal societies in the State. Later on the department discouraged the formation of such societies.

In the early years the executive staff of the department consisted of a very small number of Inspectors with the Registrar at the head. They attended to propaganda work in addition to audit and supervision. There was a great demand for societies and they showed signs of rapid expansion and increased activity. The growth in the number of societies led to a considerable enhancement of the work of supervision and audit, and the limited departmental staff found very little time for carrying on sustained and systematic propaganda. With a view to delimit the activities of the department to the statutory duties enjoined by the Regulation and to enlist non-official support, supervising unions began to be organised from 1097 (1921-22). The encouragement given by the Government to these unions in the shape of subsidies helped their development. In addition to these unions the Government appointed honorary organisers of co-operative societies in 1099. This agency was subsequently discontinued.

Non-credit activities were begun during the early days of the movement, though they did not make much headway. No concentrated effort was made towards a co-ordination of these activities and those of the credit societies. Of late, there has been a growing demand for non-credit societies and greater interest is being evinced by co-operators to form non-credit societies.

The co-operative movement has been growing in Travancore during the last twenty one years. In 1111 M. E.

there were 1,766 societies. All the societies taken together had on their rolls 220,488 members. This will be seen to be a phenomenal result when the statistics of the other Indian states and provinces are taken into consideration. The average number per primary society is also higher in Travancore. In some parts of the State there are village societies in which the number of members is more than 500. The average membership per society in 1111 M. E. was 126. Assuming that an average family consists of five persons, 1,102,440 individuals may be taken to have come within the fold of the movement.

A peculiar feature in the growth of the co-operative movement in the State has been the steady increase in the number of women members in the societies. Women freely participate in the movement. In 1111 M. E. there were 25,545 women who were members of co-operative societies. The proportion of women to men members was 1:8. There are nine societies exclusively for women and most of them carry on non-credit activities.

The working capital of the societies has not kept pace with the increase in membership. The whole movement had a working capital of Rs. 91,97,743 in 1111 M. E., the average working capital per society being Rs. 5,274. The total share capital of the movement amounted to Rs. 35,76,545. The average paid up share capital per society was Rs. 2,050 and that per member Rs. 16. The total receipts and disbursements under deposits were Rs. 21,87,717 and Rs. 20,67,799 respectively. The total turn over of all societies in the State aggregated to Rs. 1,55,32,170, the average per member being Rs. 70.

The Trivandrum Central Co-operative Bank, Ltd. of which mention has been made in the beginning is at the apex of the credit system. It corresponds to the provincial banks in British India. Its ideal is to mobilise capital by balancing surplus or deficiency in

The Central Bank.

the capital of the taluk banks and also by attracting capital from sources outside the movement and thus linking up the whole organisation with the central credit system. The bank derives its funds mainly from share subscriptions, reserve funds of societies and deposits from members and non-members. The progress of the bank during the first six years was unsatisfactory. But from the year 1097 it started on a vigorous career and showed a remarkably rapid development. The bank increased the subscribed share capital to Rs. 9 lakhs and at the end of 1111 it had 3,665 members (712 societies and 2,953 individuals), a paid up share capital of Rs. 1,42,200, a working capital of Rs. 21,62,919 and deposits amounting to Rs. 19,60,340. The rate of interest on fixed deposits was reduced from $4\frac{1}{2}$ to $3\frac{1}{2}$ per cent. The reserve fund of the bank amounted to Rs. 60,379.

In the beginning the bank financed individuals as well as primary societies. With the organisation of taluk banks at a later stage to interlink the primary societies with the central institution, the policy of discouraging primary societies to deal directly with the Central Bank was adopted. Only in exceptional cases are primary societies given loans from the Central Bank direct. "By issuing loans to individuals, primary societies, urban banks, taluk banks and banking unions, the Central Bank is combining in itself the varied functions of a primary society, a central bank and an apex bank". This policy has been criticised and the Devadhar Committee has opined that the practice of issuing loans by the Central Bank to individuals in all parts of the State is likely to stand in the way of the development of primary societies and of financing institutions and that the Central Bank should as soon as possible cease to give loans to individuals, especially in areas which are served by well managed urban banks. The Committee also recommended that when a taluk bank or a banking union has been organised for a particular area the Central Bank should not give loans to primary societies in that locality.

The following table shows the details about the Central Bank.

Central Bank.

1	2	3	4	5	6	7	8	9	10
Year.	No. of individual members	No. of society members	Aggregate paid up share capital	Subscribed share capital	The working capital (In lakhs)	Fixed and Current deposits	Reserve fund of primary societies invested in the Bank	Supervision Fund	Loans to individuals (In lakhs)
			Rs.	Rs.			Rs.	Rs.	Rs.
1102	524	519	43,730	...	7.42	4.45	52,211	3,700	95,435
1103	758	588	62,250	...	9.08	5.95	62,853	5,095	1.20 lakhs
1104	1,110	626	77,960	...	11.31	7.97	83,007		
1105	1,307	656	87,760	4,22,300	13.34	9.69	1,06,474	10,575	1.99
1106	1,830	687	1,05,720	5,41,400	13.42	11.66	1,31,028	13,345	2.06
1107	2,186	688	1,29,210	6,23,100	17.02	13.04	1,61,321	15,195	1.82
1108	2,692	698	1,51,180	7,34,600	20.06	14.33	2,03,411	20,097	3.26
1109	2,801	702	1.54 lakhs	7,52,900	21.97	13.32	2,29,286	2,000	2.54
1110	2,844	711	1.55 "	7,68,600	21.43	20.54			2,32,450
1111	2,953	712	1.42 "		21.63	11.31			2,38,682

Central Bank (Concluded).

Year	11	12	13	14	15	16	17	18	19
	Loans to societies (In lakhs)	Total outstanding ings (In lakhs)	Total percentage of arrears under principal	Percentage of arrears under interest	Net profit accrued	Reserve fund	The surpluses of the Bank	Net loss	Over-dues.
	Rs.	Rs.			Rs.	Rs.	Rs.	Rs.	Rs.
1102	1,77,860	484,952	14.7	14.2	12,169	12,542			41,107
1103	lakhs 1.92	lakhs 7.755	19.0	22.0	12,768				47,086
1104		7.720	11.1	9.5	21,524		2,87,312		34,107
1105	3.07	10.140	19.1	11.6	23,500	35,875	3,44,029		86,680
1106	2.08	10.840	29.8	29.8	25,879				1,44,087
1107	1.64	11.060	39.6	26.7	22,166	54,379			2,08,753
1108	1.71	12.400	43.7	31.6				9,800	2.67 lakhs
1109	1.45		51.8	33.4		60,379		39,913	3,85,369
1110	99,000					60,379		33,348	4,51,508
1111	2,19,619					60,379		99,008	5,21,158

The various taluk banks in the State constitute the financial agency to interlink the apex bank with rural primary societies. The taluk banks in Travancore correspond to the central banks in British India. The first taluk bank to be registered was the Nāgercōil People's Co-operative Bank, Ltd., No. 386, which in its initial stages partook of the nature of an urban bank but was eventually transformed into a bank for financing societies as well. The area of operation is conterminous with the respective taluks. They finance individuals also and admit them to membership. In 1111 M. E. there were twenty-one taluk banks including three banking unions with an aggregate working capital of Rs. 15,86,743. The detailed working of these banks is shown in the following statement.

Taluk Banks.

Year	No. of banks	Loans to societies	Loans to individuals	No. of society members	Individual members	Aggregate working capital	Reserve fund	Paid up share capital	Net profit	Net total loss
		Rs.	Rs.			Rs.	Rs.	Rs. in lakhs	Rs.	Rs.
1102	14	45,125	2,10,104	273	3,198	2,72,962	5,184		11,452	
1103	15	29,350	1'41 lakhs	485	6,080	3'88 lakhs	8,318		15,602	
1104	16	54,450	4'18 "	599	8,055	5'83 "	17,462	2'45	32,748	
1105	18	1'11 lakhs	5'22 "	715	9,968	8'59 "	30,835	3'37	43,284	
1106	20	92,410	5,58,022	790	11,503	10'93 "	47,801	4'25	51,660	
1107	20	76,998	5,21,742	869	12,920	13'02 "	67,774	4'90	70,752	
1108	21	1,02,329	4,96,627	843	14,059	14'99 "	75,020	5'49	33,845	
1109	21	0'79 lakhs	4'46 lakhs	853	14,046	15'81 "	83,155	6'03		14,128
1110	21	59,846	3,37,610	827	13,371	14'81 "	89,875			
1111	21	96,914	2,55,178			15'87 "	94,102			

The urban banks serve as the media for the distribution of co-operative finance among the middle class population inhabiting the urban areas. In the matter of financing there exists considerable over-lapping between these banks and other co-operative institutions working in the towns. In 1111 M. E. there were eighteen urban banks working in the State with a total membership of 10,304 and a working capital of Rs. 5,70,514.

The primary societies form the unit and the basis of the whole co-operative system. There are two kinds of societies under this head. They are the Primary societies. agricultural and the non-agricultural societies. The agricultural societies are composed mostly of agriculturists. In a state where agriculturists predominate in number it is natural that agricultural primary societies form the bulk. There are 1,380 agricultural societies with a membership of 149,206 and a working capital of Rs. 35,89,493. These societies were originally designed to finance agriculturists and to rescue them from the grip of the money lender. In course of time, however, loans were misapplied for unproductive purposes and most of the societies were faced with the problem of over-dues.

There were 333 non-agricultural societies with a membership of 68,329 and a working capital of Rs. 34,45,332 in 1111 M. E. Societies for backward communities for Vālans, Aṛayas and other denominations come under this category. There were twenty societies for Aṛayas, forty two societies for Vālans, twenty three for coast fishermen, ninety three for Chēṛamars and eighteen for Sāmbavars. The following statements give details about their working.

Non-agricultural societies.

Year.	Number of Societies.	Number of members.	Working capital in lakhs. Rs.	Reserved funds in lakhs. Rs.
1102	276	27,758	7·8	·5
1103	295	35,440	23·0	·5
1104	313	42,443	27·09	3·02
1105	328	48,367	19·22	1·29
1106	334	53,561	22·49	1·41
1107	341	57,720	25·51	1·79
1108	319	65,485	28·85	2·24
1109	320	79,683	31·03	2·86
1110	339	67,665	30·58	
1111	333	68,329	34·45	2·83

Agricultural societies.

Year.	Number of societies.	Number of members.	Total work- ing capital in lakhs. Rs.	Reserve funds in lakhs. Rs.
1102	1,228	122,649	18·39	1·11
1103	1,329	141,626	23·00	1·63
1104	1,377	152,535	27·09	3·02
1105	1,428	163,353	31·19	3·98
1106	1,453	165,598	33·43	4·06
1107	1,412	164,626	34·86	5·08
1108	1,401	162,256	35·30	6·10
1109	1,393	147,191	36·73	6·34
1110	1,373	153,251	35·64	6·73
1111	1,380	149,206	85·89	6·73

The organisation of supervising unions is a land-mark in the development of the movement. A union ordinarily consists of a major portion of the societies Internal supervision. in a taluk. Its management rests with a committee elected by the representatives of the affiliated societies. The chief executive officers of these unions are called supervisors. The number of these supervisors varies from three to one. The unions receive an annual subsidy from the Government. The funds of the unions consist of supervision funds and delegation fees collected from the affiliated societies and the annual grant they obtain from the Government. Instances are not wanting when a union received subvention from the Central Bank. There were twenty eight unions in 1111.

In 1100 the unions combined and formed the All Travancore Co-operative Union with the main object of undertaking propaganda, organising non-credit societies and serving as a focussing centre of co-operative opinion on various subjects affecting the movement. The name of the federation of local unions was since changed into the Travancore Co-operative Institute. The financial position of the Institute has been far from satisfactory from its beginning and this lack of funds has always worked as a handicap in the satisfactory discharge of its functions. The question of the revision of its bye-laws to suit the changing requirements of the movement is engaging the attention of its advisory board.

The co-operative movement in Travancore was from the beginning mainly intended to supply easy credit. Non-credit societies were therefore not encouraged. Non-credit activities. Until the year 1107 the number of these societies was only forty. But since then greater importance came to be attached to the formation of non-credit societies. To meet the requirements of the demand for efficient co-operative societies suited to the condition of the

country, forms of several non-credit societies were organised, some of which, like the co-operative insurance, dairying, cattle breeding and house building societies, have thus been started. The salient features of some of the important types of non-credit societies are shown below:—

Co-operative dairying.-- The problem of improving the breed of local cattle and tackling the question of the supply of pure milk on a co-operative basis was engaging the attention of the people. No sustained demand was forthcoming from the public. As a result of the incessant propaganda carried on by the department in co-ordination with the Agricultural Department, six dairy societies have been registered at Nāgercōil, Trivandrum, Quilon and Māyēlikaṛa. Of these only two have started regular work. The Thirumala Kshīravyavasāya Mahila Co-operative Society, Ltd., near Trivandrum, composed exclusively of women, is the pioneer in this sphere of activity. The milk collected from the cows owned by the members is hygienically handled, carefully bottled, sealed and distributed in the town of Trivandrum. The society guarantees the purity and genuineness of the milk. Milk is distributed among such government institutions like hospitals, the Mathilakam, etc. As a result of the working of the society many women in the rural parts are enabled to earn an honest livelihood.

A society called the Trivandrum Cattle Breeding Co-operative Society has been started to take care of the dry cows belonging to the members. The society undertakes to maintain the cows, cover them with good seed bulls and return them to the respective owners before calving. The Government have allowed the society to graze the cows in the Chūlimala Reserve Forest in the taluk of Neḍumangād.

Insurance.--The Travancore Co-operative Insurance Society is the first indigenous enterprise to undertake the business of life assurance in the State. This Society has two branches of assurance business—one rural insurance for Rs. 100 to Rs. 500 without compulsory medical examination

and the other for amounts above Rs. 500 up to Rs. 10,000 with medical fitness as a condition precedent. The Government have extended their support to this society recently by deputing a departmental Inspector to it, free of cost for a period of three years, to render the necessary advice and assistance. The Co-operative Insurance Scheme is designed to bring to the very door of even poor rural folks, the benefits and advantages of life insurance. Other co-operative societies are also allowed to take shares in this society.

House building.— There are a few house building societies in the State, for example, in Nāgercōil, Alleppey and Trivandrum.

Women's societies.—The Trivandrum Hindu Vanitha Co-operative Society is conducting a weaving school and a ladies' co-operative store besides a credit branch. Her Highness Mahārāṇi Sēthu Pārvathi Bāyi is the Patron of this society.

The women of Vanchiyūr in Trivandrum have organised and started the first and the only thrift society. The society is carrying on its work for the inculcation of the habit of self-help and thrift among the members by inducing them to save something by keeping home-saves in their houses.

Besides the Thirumala Kshīravyavasāya Mahiḷa Co-operative Society to which reference has already been made, there are a few other societies for women for promoting cottage industries, cow-rearing, etc.

Agricultural farming.—Agricultural farming on a co-operative basis is being carried on by a society called the Vasumathy Agricultural Co-operative Society by taking up nearly forty acres of swampy land on lease from the Forest Department within the reserve forests at Kulathūpula and cultivating the area with paddy.

Rural reconstruction.— The village uplift movement is also taking root in Travancore. Many a village society has evinced a desire to undertake activities of some kind or

other in furtherance of the cause of rural betterment. Two village reconstruction societies have been started, one at Thoḷukkal in Neyyāttinkara taluk and the other at Uḷḷannūr near Panthalam in Central Travancore. The co-operative societies at Neyyūr in South Travancore and Elupunna Thekku in North Travancore are also doing good work in this direction.

Marketing societies.—Recently a few primary societies for marketing have also been registered. There is a society at Mārthāṇḍam started under the auspices of the Y. M. C. A. and working under its direction, engaged in collecting and marketing eggs. Bee-keeping is encouraged. A Central Produce Society has been registered at Alleppey.

Distributive or Consumers' Societies.—There are in all thirty consumers' co-operative societies in the State. Of them the Trivandrum Co-operative Distributive Society, Ltd., No. 4, with its fourteen branches in the town, and trade transactions exceeding Rs. one and a half lakhs per annum is the most important.

School and College societies.—There are eight such societies working in the different high schools and the biggest among them is the Store run by the Mahārāja's College of Science, Trivandrum. The College Store is doing very satisfactory work, turning out business to the extent of Rs. 10,000 per annum. These societies have a great educative value, as their activities are among the educated younger generation.

Besides the foregoing types of non-credit societies, there are several miscellaneous societies, like the Government Servants' Societies and the Benefit Funds, the biggest among them being the Travancore Teachers' Co-operative Benefit Fund, Ltd.

A Committee of Enquiry presided over by the late Mr. G. K. Devadhar, President of the Servants of India Society, Poona, was appointed by the Government in 1932 to make an exhaustive survey and submit recommendations for

the improvement of Co-operation in the State. The Committee submitted its report in 1934, along with a draft bill to amend the suggestions for the better working of the societies. The bill was with slight modifications passed into law as Regulation V of 1112 and it came into operation on the 8th Madam 1112 / 19th February 1937. Several of the recommendations made by the Committee were considered by the Government and orders issued. The Co-operative Department has also been reorganised.

The co-operative societies in the State have been Concessions by Government. granted the following concessions by the Government:—

1. Remission of registration fees and exemption from payment of stamp duty in respect of instruments executed by or on behalf of any registered co-operative society, of court fees in respect of applications for the assignment of government lands and also of search fees in the Sub-Registry offices,

2. Exemption from payment of income-tax in respect of profits of co-operative societies and dividends earned by members, and interest earned on deposits by members and non-members,

3. Remittance of moneys due between co-operative societies through Government treasuries by means of R. T. R. at par,

4. Permission to open public accounts with Anchal Offices and Treasury Savings Banks on the requisition of the Registrar of Co-operative Societies or the Assistant Registrars and to make two withdrawals a week from such public accounts in the Anchal Savings Bank,

5. Free publication of the annual accounts and audit reports of the co-operative societies in the Government Gazette on the requisition of the Registrar and the supply of societies of departmental (Agricultural, Co-operative and Industries) sheets of the Government Gazette free of cost

and the full Government Gazette on payment of half the annual subscription,

6. Recovery of dues to the co-operative societies under shares and loans from government servants by heads of offices and departments on requisitions from the societies,

7. Permission granted to the secretaries of co-operative societies as such for being appointed as vendors for the sale of stamps,

8. Exemption of chitties conducted by co-operative societies and confined to the members, from registration under the Chitties Regulation,

9. Permission granted to all government servants to become members of co-operative societies and to take shares or place deposits therein; and to officers drawing a pay not exceeding Rs. 150 to serve on the committees of the societies as office-bearers on certain conditions,

10. Acceptance of co-operative societies as agents for the sale of departmental manures,

11. The assignment of thirty acres of puthuval land to each co-operative society composed mainly of backward communities without auction and without payment of tharavila, and the assignment of lands under the Land Colonisation Rules to co-operative societies registered or to be registered,

12. Authorisation given to heads of departments to place contracts for works, on the recommendation of the Registrar, with co-operative societies competent under the bye-laws to take up such business and possessing adequate resources,

13. Issue of loans by the Director of Industries to the societies of bell-metal workers on the recommendation of the Registrar.

BIBLIOGRAPHY

State Administration Reports.	Government of Travancore.
Administration Reports of the Department of Joint Stock Companies.	„
Administration Reports of the Co-operative Department.	„
Regulations and Proclamations.	„

CHAPTER XXVI

EDUCATION.

The history of education in Travancore is a long one which divides itself into the various stages by which the disorganised pial schools were encouraged and brought to fit in with a well-devised scheme of primary, secondary, and collegiate education leading ultimately to the establishment of the Travancore University. It was the talented Queen Rāṇi Pārvathi Bāyi who laid the first foundations. A succession of illustrious rulers built upon those foundations until it became a splendid edifice in the reign of His Highness Śrī Mūlam Thirunāl Mahārāja whose long reign of forty years was a period of uninterrupted progress. It was, however, destined for His Highness Śrī Chithirā Thirunāl Mahārāja to place the coping stone on that majestic edifice. It is not possible to date the beginning of Vernacular education in Travancore. Each *Kaṛa* or subdivision of the village had a *Kuḷaṛi* where physical education was imparted. Instruction in the three R's was also given to such of the children as were sent to the pial schools. The teaching was a work of love and no regular tuition fee was demanded from the pupils. The village schoolmaster appears to have been satisfied with small dues and perquisites, the individual contributions often paid in kind being small in value and irregular in the manner of payment. For higher education there were no schools. But young men who were desirous of prosecuting their studies found no difficulty in attaching themselves to the pundits, physicians and astrologers of reputation who had the kindness and generosity to help the aspirants for knowledge. More was learnt from the association with the *Guṛu* and in the light of his example than from regular teaching or pedagogic discourse.

Women of the middle classes like their sisters in high life knew to read and write and possessed no inconsiderable knowledge of things and no small share of female education.

Hindu culture as could be obtained from the study and recitation of the Purāṇas and Ithihāsas. Music was also a common accomplishment. The earliest systematic attempt in female education was made by Mrs. Mead who in 1819 established a Boarding School for Girls at Nāgercōil, meant primarily for Christian children. Her object was "to give a plain instruction united with a Christian and moral education," along with reading, writing and arithmetic. The girls were taught knitting, spinning and needlework. Crotchet and embroidery work was added and "pillow lace" work introduced. The industry of lace work gradually expanded and is now widely appreciated in India and abroad. Schools were opened at Alleppey by Mrs. Norton and at Kōṭṭayam by Mrs. Bailey. The popular feeling against sending girls to schools gradually subsided. The employment of female teachers added to its popularity. The missionaries were not content with merely establishing schools. They also tried to influence public opinion, publishing pamphlets which described the advantages of female education. A large number of mission schools were distributed throughout the State from the centres of missionary activity. Thus female education spread throughout the State.

The Government, however, did little for the spread of female education at that time. In the Administration Report of Travancore for 1038 M. E. (1862—63) Dewan T. Mādhava Rao said: "Very little, if anything, has been done for female education. This subject calls for prompt attention; such education must be, among other advantages, the foundation of important social reform." Prior to that year there were two Sirkar schools for girls in Trivandrum, one English and the other Vernacular. The former was located at the Cantonment and was meant chiefly for the education of Christian girls. The more advanced pupils received

lessons in drawing and music. French was also taught on the payment of a small fee.

The Sirkar Vernacular School opened at Kařamanai was chiefly resorted to by Brahman girls. This school received special encouragement from H. H. the First Prince, Śrī Viśākham Thirunāl, and arrangements were made to give the pupils instruction in Hindu Music. In 1045 M. E. (1869—70), at the request of the people, the Government opened a vernacular school within the Fort at Trivandrum and appointed four female teachers for the two schools in the town.

At this stage it is convenient to anticipate the work of future years. Another private English school for girls was started at Alleppey in 1049 M. E. (1873—74). The mission schools at Quilon and Alleppey began to receive grants from the Government in the year 1052 M. E. (1876—77). Co-education was freely allowed in the vernacular schools, though there were four institutions exclusively for girls. It was a distinctive feature that "in this coast females were educated in a much larger proportion than elsewhere in India." The Zanana Mission opened an English school for girls within the Fort at Trivandrum in 1039 M. E. (1863). Hindu girls continued to attend this institution which received financial aid from the Government.

The rapid increase in the number of girls attending schools may be inferred from the following statement.

Year.	Number of girls under instruction.
1070	28,933
1080	47,570
1090	73,832

The Government established a second grade college at Trivandrum in the year 1897. In 1083 M. E. (1907—08) all the girls' schools in the State were placed under the control of an Inspectress and four Assistant Inspectresses were appointed. The policy of appointing women as teachers in the Girls' School branch of the department was strictly

adhered to. The Education Reforms Committee recommended the introduction of a post-intermediate course in domestic science in the College for Women and courses in domestic science, music and drawing as well as alternative courses of studies after the IV Form in the English schools for girls.

The facilities given to female education are thus described in the Administration Report for the year 1102 M. E.:

Further Progress. "In the colleges for boys the number of women students during the year was 98 or 10 less than that in the previous year. The reason for this has already been noticed. Taking the figures for a decade, the number in 1093 was 20, which increased to 31 during the first quinquennium and to 98 during the second quinquennium. The percentage of the total increase during the decade was 390. The same phenomenal increase is witnessed in the English schools for boys, where there were 4,216 girls, or 3,372 girls more than the number a decade ago. The percentage of increase in these schools was 399. Co-education was quite common in the vernacular schools from very remote times and hence there was no extraordinary increase in the number of girls in the vernacular schools for boys. The number of girls in these schools rose from 66,225 in 1093 to 108,226 in 1102, i.e., by 42,001 or 63 per cent. The practice whereby it became possible for the education of boys and girls to be conducted in one and the same institution has been instrumental to the rapid expansion of female education in the State. In the absence of this system under which out of 176,419 girls attending schools and colleges, 112,633 or 63 per cent. attended boys' schools, the provision of separate facilities for the education of girls in the different stages of instruction would have presented difficulties of serious magnitude."

A differentiation in the curricula for girls' schools and boys' schools has been attempted by the inclusion in the curricula of girls' schools of such subjects as singing and sewing, and by the maintenance, in the English High School for Girls,

Trivandrum, and in the Thirumūlavilāsam Bālikāmaṭam, Thiruvalla, of a special section giving a course of instruction in three years to senior girls in subjects coming under domestic science, such as cooking, sick-nursing, first aid, needle-work, etc. Domestic economy has been included as an optional subject in two of the public examinations conducted by the department. Examinations in music were also held.

The following figures illustrate the rapid advance of female education in the State since the year 1100 M. E.

Year (M. E.)	Number of institutions for girls	Number under instruction					Remarks.
		Colleges	English schools	Verna- cular schools	Special schools	Total	
1100	441	224	8,418	153,815	1,105	163,502	
1101	469	232	8,802	159,978	1,467	170,479	
1102	495	192	9,585	165,118	1,524	176,419	
1103	503	203	10,428	178,817	1,503	190,951	
1104	516	238	11,150	190,786	1,525	230,699	
1105	525	236	12,165	201,286	1,503	215,190	
1106	528	230	12,809	206,882	1,513	221,434	
1107	541	265	13,529	220,646	1,494	235,934	
1108	* {	141	338	13,459	231,403	1,493	246,693
1109		142	359	11,336	240,789	1,519	257,003
1110		144	341	16,190	251,179	1,734	269,444
1111		143	337	17,047	264,841	2,092	284,317

* Recognised institutions for girls after the introduction of co-education in the schools.

Although there were separate schools for boys and girls at the primary stage until 1108 M. E. (1932-33), co-education was freely permitted in the lowest classes of the boys' schools with a view to enable young girls to study in schools near their homes. The number of girls studying in boys' schools was far greater than the number studying in girls' schools. Out of a total of 7,780 girls under instruction in 1060 M. E. (1884-85) as many as 5,278 were in mixed schools. Even in the colleges at Trivandrum co-education is allowed in subjects in which the College for Women did not offer instruction. As such, the Education Reforms Committee considered the existence of separate schools on both the English and Vernacular sides as unnecessary, and on their recommendation all primary schools except those maintained for Muslim girls were declared 'mixed schools' in 1109 (1933-34), co-education being adopted as the departmental policy as regards primary schools. In the higher classes and forms too co-education is allowed in places where separate schools or colleges for girls are not available. The subjoined statement shows the rapid advance of co-education during the years 1101-1110 M. E.

Year (M. E.)	Number of girls attending			Remarks.
	Colleges for boys	English schools for boys	Verna- cular schools for boys	
1101	108	3,868	104,583	(a) & (b) in- clude primary schools.
1102	98	4,216	108,226	
1103	82	4,690	119,172	
1104	66	5,122	127,128	
1105	62	5,725	133,663	
1106	53	6,060	138,250	
1107	67	6,471	147,827	
1108	96	6,320	156,970	
1109	124	6,956	209,648 (a)	
1110	133	8,114	219,227 (b)	

The steady increase in the number of girls attending boys' schools is not without certain defects. In the Annual Report of the Education Department for 1110 M. E. (1934-35) the Director of Public Instruction said:—

“This steady increase in the number of girls reading in boys' schools of the secondary grade is due not so much to the preference of co-education on the part of the girl pupils and their guardians as to the non-existence of separate girls' schools in many parts of the State. Though it is gratifying to note that Travancore is far in advance of other parts of India in the matter of co-education, it has to be admitted that in many co-educational schools the needs and

requirements of girls tend to be disregarded. Under co-education, as it exists at present, the girls have no share in the corporate life of the school and they generally do not take part in the extra class activities of the school, such as games and associations. Nor are separate facilities provided for them in this respect. There are not a few schools where the girl pupils do not even have separate retiring rooms. Co-education under such conditions deprives the girls of opportunities for self-expression and development of character and provides therefore a kind of training which is far inferior to what is attempted, and often attempted with a considerable measure of success, in separate girls' schools. In our so-called co-educational schools, differentiation of the curricula to the needs of girls is also not possible. Competent opinion in India and abroad, while not objecting to co-education in the primary and the university stages, is strongly in favour of separate schools for girls at the secondary stages. Financial stringency stands in the way of developing separate schools for girls at present, but when the financial conditions improve, one of the main duties of the department should be the opening of separate girls' high schools in localities where they are most needed. In this connection and in respect of female education generally, the recommendation of the Hartog Committee that 'in the interests of the advance of Indian education as a whole, priority should not be given to the claims of girls' education in every scheme of expansion' is worthy of note".

The first English school in Travancore was started by W. T. Ringletaube, a native of Prussia. From 1806 to 1816 he devoted himself to evangelical work, carrying with him the mission of English education wherever he went. He established several schools for poor children, Christian as well as non-Christian, and in 1813 there were six schools under his supervision. Instruction was given in reading,

Missionary
enterprises.

writing and arithmetic. Christian children were also taught the catechism besides being helped to read the New Testament and other religious books. Books were supplied by presents from the missionaries at Tranquebar, though not in sufficient numbers. On the recommendation of the Resident, Col. Munro, Ringletaube's efforts in the cause of education were aided by a grant of land at a nominal rental made by Rāṇi Lakshmi Bāyi. But the most important name connected with educational work in the State is that of Rev. Mead who came as a missionary of the London Mission Society in 1817 and settled in Nāgercōil. He was a very enthusiastic worker who threw himself heart and soul into the cause of education till his death in 1873. In 1818 he founded the Nāgercōil Seminary which was the first institution to give regular English education in Travancore. English, Malayālam, Tamil and Sanskrit were taught with the prime object of communicating "religious and useful knowledge". The Seminary gradually grew into a second grade college, which still continues to be a popular educational institution in South Travancore. Rev. Mead established several other institutions including industrial schools and was also the pioneer of female education in the State. The good work thus begun was continued with remarkable zeal by the London Mission Society.

Another batch of Protestant missionaries, the Church Mission Society, have also contributed largely to the growth of education in the State. In 1816 the Syrians had a college at Kōṭṭayam for training their priests and ministers. It was thrown open for secular education, the benefit of instruction being extended to non-Christians also. In the same year Rāṇi Lakshmi Bāyi sanctioned a donation of Rs. 20,000 to the funds of the college and a monthly grant of Rs. 70 for the hospital attached to it. The college was handed over to the Church Mission Society in 1837 when the Syrians separated from the Mission. It soon became a second grade college and was affiliated to the University of

Madras. Later on, the Catholic missionaries entered the field and greatly interested themselves in the spread of female education. They too received substantial aid from the Government in the shape of grants of land. Thus higher education in Travancore, on modern lines, dates so far back as the second decade of the nineteenth century when the London Mission and the Church Mission Societies established two English schools at Nāgercōil and Kōṭṭayam.

The direct activity of the State in the field of education began more than a century ago in 992 M. E. (1817 A. D.) when Her Highness Rāṇi Gouri
 State activity. Pārvathi Bāyi issued a rescript directing “that the State should defray the entire cost of the education of its people in order that there might be no backwardness in the spread of enlightenment among them, that by diffusion of education they might become better subjects and public servants, and that the reputation of the State might be advanced thereby”. Schools were established in several places. Men of suitable qualifications were appointed as teachers. Every vernacular school was to have two teachers paid by the State, each teacher receiving a monthly salary of fifty fanams, (a little over Rs. 7). The Tahsildar of the taluk was to inspect the school once in fifteen days, acquaint himself with the details of management, find out the number of pupils, the quality of teaching and the level of their studies and send reports to the Huzur Cutchery. This was a clear recognition of the principle that the cost of education is a charge on public funds and the supervision thereof is the legitimate function of the State. But educational activity in the modern sense of the term dates only from the year 1834 when His Highness Swāthi Thirunāl Mahārāja visited the English Seminary at Nāgercōil and, impressed with the necessity of increasing English education in the State, invited Mr. Roberts, the Headmaster of the institution, to start an English school for boys at the

capital. The school was soon started. As instruction was imparted free, the number of students admitted was at first necessarily limited. It was a private school and the Government contributed the fees for eighty pupils. In less than a year Mr. Roberts' school was taken over by the Government and became His Highness the Mahārāja's Free School. The school continued a free institution till 1863-64. In that year the Government recognised that the time had come to levy a small fee from all boys admitted to the school. The rate of fees prescribed was very reasonable, ranging from four annas to half a rupee per month. Originally the number of admissions was restricted as the Government paid only the fees of eighty students. When the fee system was introduced, the restriction on admission was withdrawn. Immediately the number on rolls rose to 500. All classes of people responded to the call of education, and despite the natural prejudices against the study of a foreign language, members of the most conservative and orthodox section of the people sought admission to the school. With a view to create a stimulus for study among the students of the district schools, six scholarships were founded in the Trivandrum school. In 1866 the Free School was raised to the status of a college and the classes were divided into Junior and Senior Departments, with a preparatory school attached to the former. The Senior Department sent up candidates for the examinations of the University of Madras. A spacious building for housing the college was constructed in 1945 M. E.

In laying the foundation stone of that building which is the parent structure of H. H. the Mahārāja's College of Science, the Mahārāja said: "I consider this as a grand occasion. In laying the foundation for a college we are in fact imparting strength and durability to a system of public education of a high order, which cannot fail to exercise a most important influence on the rising generation and on generations yet unborn.

“It is gratifying to me to reflect that English education struck early root in Travancore, that under favourable auspices it has attained satisfactory growth and that, already pressing on the material limits provided for it by my venerated predecessors, it now calls for enlarged accommodation.

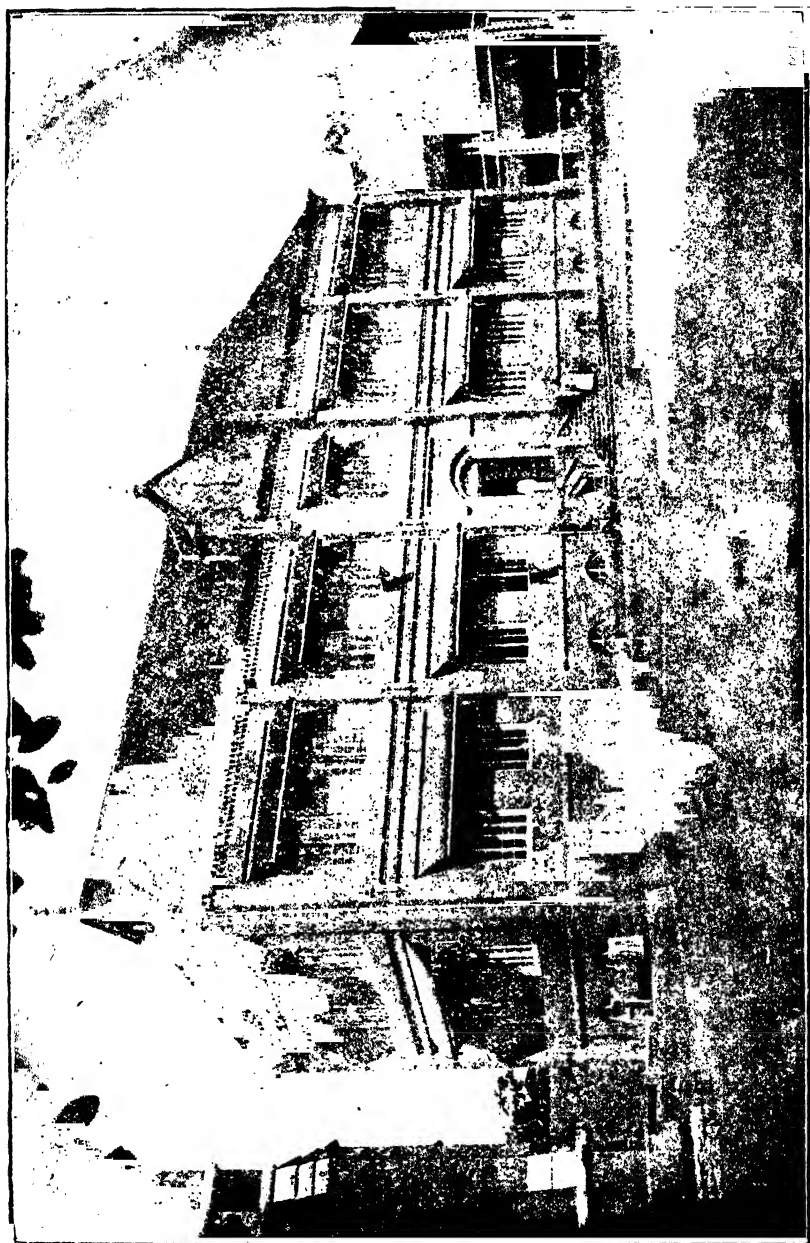
“Such a call, it is superfluous for me to say, will, at all times, be responded to by the State with the utmost alacrity.

“You have seen the excellent plan of the proposed college prepared by our esteemed Chief Engineer. I am sure that with Mr. Barton execution will not fall short of conception, and I may therefore hope that before long I shall have the happiness of inviting friends and well-wishers to assemble again for the purpose of opening a spacious, solid and durable building to which the Government and people can point with pleasure and pride—a building that will be more commensurate with the standard to which Mr. John Ross, with the able assistance he enjoys, has raised the education of our youth.

“I hope to see this standard raised still higher, till it claims to be on a level with even that attained by the most advanced educational institutions in India.

“I hope I am not over-sanguine. There is every encouragement to be derived from the steady zeal of those who are charged with the weighty interests of education, from the great eagerness shown by parents for the intellectual advancement of their children, and from the remarkable receptive manifested by the youths themselves.

“To the numerous pupils I see assembled on this auspicious occasion, I will only say, pursue your various studies with the utmost devotion and perseverance; you show yourselves worthy of the anxious care bestowed on you by your country for cultivated intelligence and, even overflowing into other countries, prove yourselves formidable yet friendly rivals to those whom other colleges send abroad.



The Physics Laboratory, College of Science.

By such a course you will win credit for yourselves and honour for your country.

"It now remains that I invoke fervently the blessing of the Almighty on our task and proceed to perform my part of this day's ceremonial".

The building was completed in 1873. Piles of buildings have been added subsequently at the cost of many lakhs of rupees.

In 1875 provision was also made for the legal training of the rising generation by the establishment of a law class. Dr. Ormsby, a judge of the Sadr Court, was appointed the first Professor of Law. The colleges were affiliated to the University of Madras. Till 1883 the subjects taught for the degree courses were English, a Second Language (Sanskrit or Malayāḷam), Philosophy, History, Mathematics and Law. A Chemistry chair was opened in 1884 with Mr. H. N. Reade as Professor. The Philosophy chair also had become popular under Dr. Harvey and his pupil, P. Sundaram Pillai. The Trivandrum College soon found a reputation throughout the Madras Presidency for efficient teaching and an academic atmosphere. Its alumni rendered excellent accounts of themselves in various professions. Of them Mahārāja Viśakhāṁ Thirunāl said in April 1882:—"That the native portion of the Government Service and of the Bar has immensely improved during the past forty years is a fact which the most cavilling critic will not deny. If this result full of importance is not to be traced to the higher education given by Government, to what else is it due? The result is a happy one equally to the governing and governed classes. The good is far from being confined to British territories.....Every educated native in or out of Government Service is a radiant point of enlightenment possessing mainly self-respect and grateful loyalty Government".

The policy of establishing schools was not confined to the capital town. About the time the Free School was

established, district English schools had been opened at Kāyamkulam, Kōṭṭār and such other places and placed under the general supervision of Mr. Roberts. The district schools were, however, neglected for a time on account of financial difficulties. They were again revived in 1049 M. E.

The development of vernacular education also received increasing recognition. The Government earmarked an allotment for vernacular schools in the districts on a sound and well-matured plan.

Vernacular
education.

In the year 1042 M. E. Mr. Śankaśasubbier was appointed Director of Vernacular Education. A Central Vernacular School was started in Trivandrum and 11 district schools were opened in different parts of the country. The total number of pupils who were under instruction in all the vernacular schools taken together was 855. A system of grants-in-aid was sanctioned to private schools in 1044. Within two years the number of district schools rose to 49 of which 29 were departmental and 20 aided schools. The number of pupils under instruction rose to 2,455 in two years. In 1044 the Director said:— "Vernacular Schools are manifestly rising in popularity. Vernacular education is more and more appreciated by the people." In 1046, a new scheme for promoting vernacular education was sanctioned by the Government. According to it each prowerthy was to have one school, though of a lower order. The inhabitants were to find the necessary buildings, while the Government undertook to pay a small grant of one fanam for each pupil as a part of the remuneration to be given to the teachers. The course of instruction in the schools thus established consisted of reading, writing (both on cadjan and paper), arithmetic, geography and history. The course of instruction in the taluk schools was the same but the standard was higher. In the Central Vernacular School at Trivandrum the standard was higher still and embraced Euclid (the whole of the First Book), algebra (to simple equations) and

histories of India and Travancore. In a few schools there was provision made for teaching Sanskrit. Tamil was taught in most of the schools in South Travancore. The efficiency of inspection was improved. In 1047, when Mr. Śankarāsubbier was transferred to the Revenue Department, there were 188 schools in working order, of which 23 were government district schools, 141 prowerthy or village schools and 18 grant-in-aid schools. Ten Deputy Inspectors were appointed to supervise the working of the prowerthy schools. The number of vernacular schools steadily increased. In 1049 their number was 233 with a strength of 11,436 pupils. The sum allotted as grants-in-aid also increased. The aided schools showed marked progress. In 1049 the district schools were thrown open to all communities, thus conferring the chance of education in some measure, however small, to the backward classes. In 1051 the rules regulating grants were declared applicable "to all schools under whatever management" which taught vernacular up to a certain standard and which showed an attendance of not less than twenty five pupils. The grant was not to exceed Rs. 75 to schools with an attendance of forty or above and Rs. 50 to those having an attendance of below forty. It was calculated that the grant should cover one half of the estimated salary of the teaching staff. This policy resulted in a remarkable increase in the number of vernacular schools. The following statements compare the figures relating to English and vernacular education in 1049 and 1058 M. E.

English schools.

Year	Government schools		Aided schools		Total		Cost.		
	No.	Strength	No.	Strength	No.	Strength	Gross ex-penditure	Fees	Net ex-penditure.
							Rs.	Rs.	Rs.
1049	20	1,862	...	...	20	1,862	51,609	7,331	44,278
1058	23	2,450	3	316	26	2,766	60,950	12,263	48,687

Vernacular schools.

Year	Government schools		Aided schools		Total	Cost.					
	District		Village			Gross expenditure	Fees	Net expenditure.			
	No.	Strength	No.	Strength	No.				Strength	Rs.	Rs.
1049	28	1,954	149	6,199	20	1,484	197	9,637	42,883	11,375	31,508
1058	39	3,678	184	10,049	440	21,861	663	35,588	82,302	19,648	62,654

It will be seen from the above statements that while the progress in English education was slow, there was marked advance in vernacular education—an advance which to a large extent was achieved by the policy of giving grants-in-aid to private schools. The total number of schools, however, English and vernacular taken together, during the period 1049 M. E. and 1058 M. E. increased from 217 to 689 or by 217·5 per cent. and of pupils from 11,499 to 38,354 or by 234·5 per cent. The net expenditure which was Rs. 75,786 in 1049 rose to Rs. 1,11,341 in 1058, i. e., by 49 per cent.

The year 1069 M. E. forms an important landmark in the progress of vernacular education. In that year the Government decided to bring in as far as possible all the existing indigenous schools within the government educational system by giving them grants-in-aid and subjecting them to departmental inspection. This necessitated an increase in the Inspecting Staff from thirteen to thirty two officers. The Text Book Committee which was constituted in 1042 M. E. (1866-67) was also reorganised and improved. The schools were classified into higher, middle and lower according to the standards of instruction imparted. Separate vernacular schools for girls were started in 1063 M. E. Till then boys and girls sat together in all the vernacular schools. In 1067 M. E. the fees in all the lowest classes of the vernacular village schools were abolished and those in the next higher classes considerably reduced, with a view to help the poor who attended the schools.

Meanwhile, English education also received the attention which it deserved. With a view to relieve the Principal of H. H. the Mahārāja's College as far as possible from his onerous duties as Superintendent of District Schools and to provide better supervision to these schools, a full time Superintendent of Schools was appointed in 1062, the Principal still retaining the power to direct the course of instruction and to

exercise general supervision as the Director of English Education. In 1063 M. E. the advantages of the system of grant-in-aid were extended to private English schools. The number of aided English schools which was only five in 1065 M. E. rose to twenty two in 1069 M. E. In furtherance of the object of the Government to have a "range of 4 high schools running from north to south at a distance of 40 miles from each other," the district schools at Kōṭṭayam, Quilon and Alleppey were raised to the High School standard.

The claims of special and technical education were also recognised. Travancore entered the field of technical education late, though earlier than the other Indian States and Provinces. The Christian missionaries were the first to introduce arts and industrial education in the country. In 1820 Rev. C. Mead founded the School of Industry at Nāgercōil for the purpose of promoting popular arts and instructing the "children of industrious parents". The boys were first taught lessons in printing and book-binding. Similar schools were established at Neyyar and other places. Among the industries taught and spread at the instance of the missionaries we need only record a passing reference to the manufacture of paper, the art of weaving, the rearing of silk-worms and the manufacture of sugar and indigo. But this benevolent enterprise inaugurated by Rev. Mead was neglected by the mission for some time.

A Medical Class under the charge of the Brigade Medical Officer was started in 1038 M. E. (1862-63) to train stipendiaries for employment as Dressers. The Medical School which was maintained for imparting training to candidates for admission to the Medical Service was closed after some years, but it was revived in 1060 M. E. (1884-85) with a new class of ten students.

A Law Class with a teacher engaged from Madras was, as has been said, attached to the Central School at

Trivandrum in 1038 M. E. (1863-64). A Vernacular Law Class also was opened in the next year to train applicants for posts in the Police Department. This arrangement continued for four years.

The School of Arts:—In 1041 M. E. (1865-66) the Government maintained a small establishment consisting of a group of carvers, two artists and a photographer, attached to the Huzur Cutchery. This establishment was transferred to the Education Department in 1064 M. E. and has since been called the Industrial School of Arts with two branches, the Art Branch and the Industrial Branch. The work done was of such fine quality that the Superintendent of the Madras School of Arts wrote:—

“I am glad to notice that the School of Arts, which was started last year at Trivandrum, under the direction of trained students from this school, is doing good work, especially in providing designs of a pure Indian type for the ivory carvers employed by the Travancore State. This is an industry which might be developed into an important one, if the wretched European designs formerly in vogue are entirely given up for good native patterns. Good native ivory work would have an almost unlimited market in Europe and America.”

Pottery and porcelain work also received encouragement. In 1069 M. E. (1888-89) experiments were made in this institution with stone, clay, etc. collected from different parts of the country, to ascertain their fitness for the manufacture of superior pottery and porcelain. Several models of table ornaments, paper-weights and ornamental flower vases were made successfully. The best workmen in the various industries established in the State were encouraged through the revenue authorities to produce really artistic works and send them to the School of Arts for exhibition and sale. Steps were taken to introduce carpet-weaving and stained glass work as subjects of study in the school. The rules relating to the constitution and working of the

school were passed in 1071 M. E. (1895-96). The school now provides for the teaching of wood-carving, smithery work, lacquer work, pottery, drawing and painting. It sends up candidates for the Lower and Higher Examinations of the Madras Government in Drawing, Design, Wood-work and Painting.

The Śrī Mūlam Technical Institute at Nāgercōil, which provided for a three years' course in weaving and which was in receipt of grant-in-aid, was taken over under government management in 1080 M. E. (1904). There were sixteen aided technical schools in the State at the close of 1080 M. E. A scheme was sanctioned for awarding scholarships for technical studies in foreign countries. This was followed by a large increase in the number of technical schools, both departmental and private. In 1110 M. E. (1933), besides the institutions mentioned above, there were the Śrī Mūlam Technical School, Trivandrum; the Carpentry School, Quilon; the School of Commerce, Alleppy; the Textile Institute and sixty eight private institutions recognised by the Department of Industries. Of the latter sixty one were in receipt of grants-in-aid. The Agricultural Department maintained three agricultural schools, one each at Koṭṭārakaṇa, Alwaye and Kōnni.

The Śrī Mūlam Technical School provides for the Civil Engineer's course, the Mechanical Overseer's course and a class for Maistries. The Education Reforms Committee observed: "The courses in this school are of an elementary kind and provide a minimum of civil and mechanical engineering knowledge for the lowest grade of Supervisors in the Department of Public Works...and the school has no provision for training industrial apprentices in any form of engineering."

The Carpentry School, Quilon, provides a three years' course in Estimating, Arithmetic, Mensuration, Drawing, Building Materials, Construction, Carpentry and Cabinet-making.

The School of Commerce, Alleppey, prepares students for the Lower and Higher Examinations of the Madras Government in Type-writing, Shorthand, Book-keeping, Commercial Geography and the Theory and Practice of Commerce.

The Technical Institute, Trivandrum, provides for a two years' course in textile industries for teachers, a six months' course in the technology of bleaching, dyeing and printing and a six months' course in knitting and hosiery manufacture.

The private schools gave instruction in cotton-weaving, coir-weaving, mat-weaving, rattan works and carpentry, but very few of them were correlated with the schools for general education or with the demands of local industry.

Dealing with the question of technical education in the State, the Education Reforms Committee observed:—"Till very recently there was little provision in the educational system of Travancore for special and vocational instruction. There is no practical bias in the vernacular schools and no satisfactory practical or vocational work is being done in the English schools. Collegiate institutions in the State are confined to arts courses and there is no provision for any form of engineering or technology. The number of technical schools controlled by departments other than the Education Department is small, and these schools, generally speaking, provide only lower grade technical instruction.....As in the other parts of India, the probable reasons for the tardy progress of technical education in the State are the difficulties of finance, the need for cultural courses of study as distinct from utilitarian forms of education and the lack of industrial occupation open to specially trained men." They accordingly made the following recommendations for the improvement of technical education:—

1. The abolition or complete reorganisation on improved standards of the existing lower grade technical schools, particularly the aided schools,

2. The opening of agricultural bias schools,
3. The creation of a limited number of departmental and private technical schools, taking the form either of alternative courses located in the existing high schools or of independent technical schools, and providing instruction in the industrial arts of wood, glass and metal as well as in agricultural and commercial subjects with additional provision for continuation classes for adults already in industrial employment, who may desire to improve their technical skill,
4. The investigation of the possibility of establishing a system of stipendiary apprentices working in the well-established factories and workshops in the State,
5. The provision of a limited number of technical scholarships for subjects of technical study needed in the State, for Travancore students to proceed for higher technical study in other parts of India or Europe,
6. The institution of an industrial and economic survey of the State so as to enable the Government to decide as to the most useful subjects of study,
7. The opening of a College of Technology having intermediate classes in agriculture, accountancy, mechanical engineering, electrical engineering and motor engineering, and diploma courses intimately related to the possibilities of the development of small and large scale industries in the State,
8. The establishment of a medical school in Travandrum,
9. The investigation into the condition of the schools for the teaching of music and fine arts and their reorganisation, and
10. The transfer of the Vedic schools to the Dēvaswom Department, the recognition of the Sanskrit schools as English middle schools having a special Sanskrit bias, and the affiliation of the Sanskrit College to the Madras University in the Vidwān and Śrīrōmaṇi courses, the

Mahōpādhyāya course being retained as an independent study inculcating the highest attainment in Sanskrit.

The Government have already given effect to some of these recommendations, e. g., those relating to the Vedic schools and the Sanskrit College as well as the creation of alternative courses in the high schools. In 1110 M. E. (1934-35) the Committee on Technological Education submitted their proposals for the introduction of technological courses in the College of Science. These proposals are expected to be dealt with by the Travancore University.

The progress made in education during the ten years from 1059-1069 M. E. may be seen from the facts that while in 1059 there were only 769 schools with a strength of 44,142, in 1069 there were 1,690 schools with a total strength of 89,131. The expenditure on education rose from Rs. 1,48,536 in 1059 to Rs. 2,83,248 in 1069.*

Progress of
education.

Educational reforms:—The year 1070 saw many important reforms. Rules were made for the management of aided and recognised schools which were classified according to a definite system. A proper curriculum of studies was prescribed for the aided and recognised schools. Rules were also formulated regarding organisation and management, the qualifications of teachers, and buildings and accommodation. Dr. A. Chricton Mitchell, Principal of H. H. the Mahārāja's College, was appointed Education Secretary to Government. Educational institutions were divided into three classes, those for university education, those for general education and those for special education. The English and vernacular schools were classified into high, middle and primary. The State was divided into three ranges each under

* This figure is taken from the Report of the Education Expenditure Committee. The Administration Report for 1069 gives the figure as 3,19,109,



The College for Women.

an Inspector and all schools, English and vernacular, with the exception of H. H. the Mahārāja's College, the Girls' English School, the School of Arts and the Sanskrit College were placed under him. The three ranges were divided into twelve districts and an Assistant Inspector was appointed to each. Nine Sub-Assistant Inspectors were also appointed. The posts of the Superintendent of District Schools, the Director of Vernacular Education and the Head Inspectors were abolished. A revised Grant-in-aid Code was promulgated. This re-orientation was followed by a period of great educational activity. Female education received special impetus during this period by the abolition of fees for girls in all grades of schools, the opening of a large number of vernacular girls' schools, and the raising of the Girls' High School at Trivandrum to a second grade college.

In 1077 M. E. an important change was effected in the classification of schools. The old classification was given up. The schools were now divided into high schools, middle schools, upper primary and lower primary. The lower primary schools comprised classes 1 & 2 and the upper primary schools classes 4 and 5. English was taught as a Second Language in the upper primary classes. At this stage a bifurcation was allowed. The English middle school had forms I to III and the Malayāḷam middle schools classes 5 and 6. The English high schools comprised forms IV to VI and the Malayāḷam high schools classes 7 and 8. The new classification of schools necessitated the removal of the Lower Primary Department from the English to the vernacular schools in the same locality. In the English middle and high schools, Malayāḷam was taught as a Second Language, while in the Malayāḷam middle and high schools, English was taught as a Second Language. According to this arrangement classes 1 to 4 formed the first training ground. A pupil who passed out of class 4 could proceed either to an English middle school or to a vernacular middle school.

Among the important reforms effected between 1077 and 1084 M. E. were the following :—

1. In 1079 the Government definitely accepted the responsibility of imparting free primary education to all children in the State. As a first step, fees were abolished in all schools for the backward classes and full salary grants were allowed to all private schools maintained for them. In 1080 fees in class 1 in all government schools were abolished and the fees in classes 2 and 3 were reduced to 2 and 3 chuckrams respectively.

2. The period of training of teachers was increased from one year to two years.

3. Four special normal schools were established for the training of teachers belonging to the backward classes.

4. In 1084 the girls' schools were removed from the control of the Inspectors and placed under an Inspector of Girls' Schools with four Assistant Inspectresses.

5. Encouragement was given to the education of Muhammadans by granting them special concessions in the rates of fees, the amount of salary grants, etc.

6. The minimum pay of teachers in the vernacular schools was raised from Rs. 5 to Rs. 7.

7. Sirkar English schools were withdrawn from places where private schools were found thriving. The schools at Thiruvalla and Changanāssēry were accordingly abolished. The middle schools at Thiruvattār and Chirayinkl were also abolished as being unnecessary.

An important measure of reform was carried out in the administration of the department in 1084 M. E. Hitherto there was no common head to organise and direct the various educational activities in the State. With a view to remedy this defect, the Government appointed a Director of Public Instruction and placed the entire department under his control. The officer chosen was again Dr. Mitchell.

The passing of the Education Code was considered to be a necessary preliminary to educational reform. For an adequate comprehension of the scope and object of the Code it is necessary to state a few facts. At the close of the year 1883 the system of education was as follows:— Besides the colleges maintained by the Government and private bodies there were two types of educational institutions, the English schools and the vernacular schools. They were classified according to the nature of the management as Sirkar or private. Private schools were either aided or unaided. All the Sirkar and aided schools and a few of the unaided schools were recognised institutions. All recognised institutions were subject to departmental inspection. Primary education was given in the vernacular in the primary schools and in the primary classes attached to the middle or high schools. Secondary education was given in the vernacular middle and high schools and in the English schools. Collegiate education in arts was given in the arts colleges and in law in the Law College, both organised and conducted in accordance with the regulations of the Madras University. Special education was given in the training schools, the Sanskrit schools, the school for the training of overseers and other subordinates of the Public Works Department and the School of Arts at Trivandrum. .

The management of the Education Department vested in three Range Inspectors of Schools and the heads of colleges. The Inspectors were in direct charge of all the middle and high schools, English and vernacular, both for boys and for girls, and also of all the special schools. The Range Inspectors worked directly under the Government. The colleges were under the charge of their respective Principals who were also directly under the Government. The defects of the system, as noticed by the Government, were the existence of a number of private schools which were unrecognised and could not therefore be made to

conform to departmental standards. There were the wants of good buildings and equipments for elementary schools generally. 'Inspection was neither adequate nor intelligent.' Notwithstanding the reforms effected from time to time the administration of the department was not as efficient as could be desired. The Government therefore decided to make a more efficient arrangement for the co-ordination of educational effort by the appointment in 1084 of a Director of Public Instruction. The Ranges were reduced from three to two with a corresponding reduction in the number of Inspectors. The number of districts as well as the number of Assistant Inspectors, however, remained the same, viz., twelve. The Inspectress of Girls' Schools was given four Assistants.

The introduction of the Education Code in 1085 effected a thorough remodelling of the department. The Code is a comprehensive measure dealing with the classification, management, accommodation and equipment of schools. It prescribed the qualifications of teachers and the conditions which they should observe in the practice of their profession; regulated school term fees, text books, school records and returns; and dealt with the recognition of schools and the rules for grants-in-aid. The object of the Code was also to define the position which each school occupied in the system of Public Instruction, to improve the efficiency of the management by regulating the powers of the managers, to bring the teachers under their control by licensing them and to prevent the unnecessary migration of pupils from school to school by generally insisting on effective discipline. The provisions of the Code were also such as were calculated to render larger facilities for education to non-caste Hindus by removing the restrictions on their admission into public schools. It may be noted that at that time members of certain communities were denied admission as they were deemed to be untouchable and unapproachable by force of the existing custom. The aim of the Code was to improve the tone of education by

strengthening departmental control. A number of 'unrecognised' schools which were lacking in management and discipline and were poor in instruction were discouraged. A large number of private unrecognised schools then went out of existence, but efforts were made to replace them as far as possible by opening government schools. "The chief measures of the period," says the Report of the Travancore University Committee (1923-24), "were the promulgation of a new Education Code and a new Inspection Code, the revision of the curricula of the English and vernacular schools, the introduction of Manual Training, the reorganisation of female education, for which an Inspectress of Schools had been appointed in 1908, the substitution of the School Leaving Certificate Scheme for the old Matriculation Examination conducted by the University of Madras, and the foundation of the Training College for Teachers. Tests of efficiency were imposed on all schools demanding recognition and were rigorously enforced. The pay of teachers in the schools was again revised on generous lines. A liberal scheme of scholarship was also sanctioned. Special stress was laid upon the possession of high academic qualifications for educational employment, particularly in the collegiate and secondary departments. In short, education was "toned up" completely. The stimulus and the support for these reforms came of course from His Highness the late Mahārāja and the Dewan, Dewan Bahadur Sir P. Rājagōpālāchāri. It fell to Dr. Mitchell and to his successor, Dr. A. W. Bishop, who had both been Principals of the college, to see the reforms through. The figures for the last decade furnished in the appendix to our Report will show that the progress has been well sustained in every department of educational activity within the State, since this eventful epoch in its educational history. But the drastic changes introduced by the Code evoked considerable opposition in the continuance of the policy of the reorganisation of the department and the working of the Education Code may be seen from the following table" :—

Year	No. of institutions.				Strength.				Gross ex- penditure		Receipts		Net ex- penditure.	
	Govern- ment	Private aided	Private unaided	Total	Govern- ment	Private aided	Private unaided	Total	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1085	498	1,329	*1,908	3,735	68,589	82,123	66,956	217,668	7,55,022	1,71,409	5,83,613			
1086	517	805	326	1,648	79,526	56,491	23,648	159,668	7,59,668	1,72,584	6,23,129			
1087	703	837	158	1,698	106,215	59,902	12,658	178,775	9,55,951	2,06,131	7,49,000			
1088	828	856	79	1,763	132,616	65,530	6,825	204,971	12,84,450	2,56,581	10,27,869			
1089	841	863	67	1,771	146,299	72,289	753	225,341	15,89,080	3,06,503	12,82,577			
1090	1,020	870	146	2,036	174,940	76,770	13,213	264,923	18,53,540	3,86,921	14,66,619			

* Including 1,895 unrecognised schools.

The noteworthy features of the period were the fall in the number of private schools and the increase in the strength of departmental schools. The Private enterprise. departmental expenditure rose from Rs. 5,83,613 in 1085 to Rs. 14,66,619 in 1090. The enhancement of the pay of professors and teachers was also responsible for this increase. However, in 1091, Mr. Hodgson, the Director of Public Instruction, proposed a change of policy which soon after gravitated towards the restoration of the old policy of encouraging private schools, particularly the private elementary schools. Rural schools were started in 1092 M. E. for the benefit of people who were unable to go in for higher education on account of poverty or other peculiar conditions of life. The pial schools once condemned were again restored to favour. Co-education was permitted in the lowest classes, 1 and 2. Higher grade English schools were also multiplied. Special encouragement was given to the education of Muham-madans by the award of scholarships and by the appointment of a Muhammadan Inspector to supervise the teaching of Arabic. This educational activity demanded a large number of trained teachers. Ten moffussil training schools were therefore opened to train vernacular middle school teachers. In a single year, 1091, twelve English schools and 377 Elementary schools were started under private management. During the period 1091 to 1094, the number of departmental institutions showed only an increase of fifty six schools, while the corresponding increase in the number of private institutions was so high as 353. The following observations of the Education Expenditure Committee of 1921 are instructive:—

“In 1049, there were 217 schools in the State with a total strength of 11,499 pupils. In 1094, there were 2,845 institutions and the number of pupils had increased to 365,868. The gross expenditure to Government had increased from Rs. 94,492 to Rs. 23,46,853 and the net expenditure from Rs. 75,786 to Rs. 17,70,623. Vast developments had also taken place in the system of administration. The

scattered forces have been consolidated and brought under control and the progress of education on sound lines ensured. Thus in the course of nearly half a century, education in Travancore has, under the sedulous and fostering care of His Highness' Government, grown from a tender and tiny plant into a gigantic tree stretching its vigorous branches to the remotest corners of the country. This is a result of which the Government and the people of the country may be justly proud".

The Committee stressed the importance of elementary education in the vernacular suited to the needs of the people. It would dispel their ignorance, widen their outlook on life, qualify them to participate intelligently in the political life of the country and improve their economic efficiency. The importance of universal primary education was emphasised and a recommendation was made that the efforts of the State should be put forth in an increasing measure. The suggestion made in certain quarters favouring the reimposition of fees in the lower grade vernacular schools was repelled. Private enterprise was to be depended on in the main. But the Committee expressed themselves in favour of maintaining two departmental schools at least in a revenue pakuthi, one for boys and the other for girls. Wherever private local enterprise was not coming in, the Government was to step in and open schools. The Committee drew the attention of the Government to the urgent necessity of providing a sufficiency of technical education to impart training in the arts and crafts which should afford a means of livelihood. It was found that the Education Department was spending a larger percentage of the 'total revenue of the State than was the case in any other Province or State in India. The Committee recommended the imposition of an Education Cess. One of their other important recommendations was that the general control over lower grade vernacular education might be vested in local committees to be created by legislative enactments. In municipal

towns the control was to rest with the municipal authorities who were to find the funds, supplemented of course by contribution from the Government.

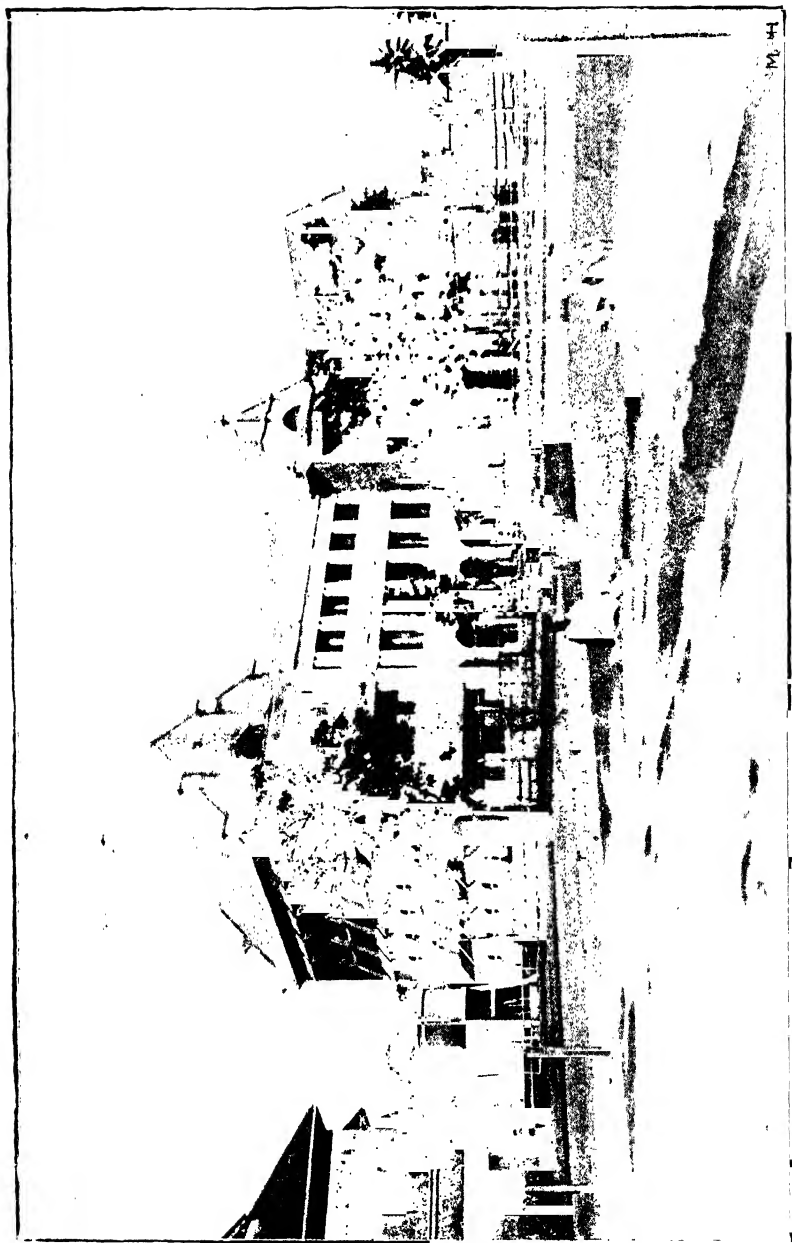
Notwithstanding the facilities offered by the Government, which were of the most liberal character, the representatives of the people complained that vernacular education was not receiving sufficient consideration at the hands of the Government. It was suggested that the Education Code sanctioned a retrograde policy. Dewan M. Krishnan Nāyar made a promise to the members of the Śrī Mūlam Popular Assembly at its 9th session that the matter would receive due attention. In pursuance of the promise the Government appointed a Committee of nine members with Dewan Bahadur A. Gōvinda Pillai as Chairman. The Committee was asked to consider whether the changes introduced by the Education Code had operated (1) against the development of vernacular education and, if so, how? (2) whether under existing conditions it was practicable to raise the standard of vernacular education and, if so, on what lines? (3) whether it was necessary to introduce a separate higher examination in the vernacular after a pupil secured the Elementary School Leaving Certificate and, if so, what should be the scope and method of that examination and how it should be conducted, and whether in that case the Elementary School Leaving Certificate should be retained? (4) whether the text books in use in the elementary schools were suitable, and, if not, how they could be improved; whether suitable text books for imparting instruction of a higher standard, solely in the vernacular, existed and if not, how were they to be supplied? and (5) whether it would be possible to find suitable and remunerative employment for those who might pass a high standard examination purely in the vernacular?

The Committee made the following recommendations covering a very wide ground. The most important proposals were (1) that the classification of schools in the Education

Code be so changed as to include secondary education in the vernacular schools also, (2) that the number of schools that each Inspecting Officer had to inspect during the year should not be more than fifty so as to allow him sufficient time to thoroughly inspect a school, watch the teaching, advise teachers and give model lessons, (3) that in the appointment of Inspecting Officers a thorough knowledge of the vernacular language should be considered an indispensable qualification, (4) that the standard of vernacular education should be raised, (5) that English be taught as a compulsory subject from the 5th class upwards, (6) that the Text Book Committee be strengthened by appointing a fair number of scholars from outside the Education Department, (7) that village reading rooms should be started and that public lectures in the moffussil should be encouraged. Suggestions were also made for instituting a higher vernacular examination, the preparation of suitable text books in non-language subjects, reference books and scientific treatises.

By this time another committee appointed to propose suggestions for the revision of the curricula of studies for the vernacular schools for boys also sent their report. The two reports were placed before a conference of officials and non-officials. Several of the suggestions of the two committees and the conference were adopted by the Government. The post of Deputy Director was abolished in 1096 M. E. and the office of the Chief Inspector of Vernacular Schools for Boys was created in its place.

The policy of encouraging night schools for the education of adults was strengthened in 1901 M. E. The enhancement of fees sanctioned towards the close of 1096 M. E. was brought into force from the beginning of the school year 1098 M. E. (1922-23) in all recognised English schools and vernacular middle and high schools for girls. The peaceful administration of the department was disturbed by the occurrence of a students' strike which originated in



The College of Arts.

Trivandrum as a protest against the raising of the fees. But order was soon restored.

The insufficiency of accommodation in the government colleges and the working of the rules on the subject constrained numerous students to seek admission in colleges outside Travancore. The Government, therefore, appointed a committee to consider the question of accommodation in His Highness the Mahārāja's College, Trivandrum, with a view to the admission of more students into the college. The orders passed by the Government on the report resulted in larger admissions. In 1099 M. E. the arts sections of His Highness the Mahārāja's College were removed to the new building in the premises of the Training College, Thykad. New chairs were established in the College of Science.

Spinning as a form of manual training was introduced in twenty two vernacular schools in 1100 M. E. The following extract from the Administration Report for the year 1101 M. E. is instructive. "In the matter of education, the Government have always pursued a liberal and progressive policy and the remarkable advance in education made during the past few decades has been due to their sedulous and fostering care. Travancore now stands in the forefront of educated India. As regards primary education, its utmost importance has always been recognised and everything practicable is being done to make it universal. Government are now spending about rupees thirty seven and a half lakhs or nearly 17 per cent. of the State revenue on education and as it is impracticable to spend from general revenues more lavishly than at present, the further development of education in the country will have to depend more largely on private enterprise, and this the Government are encouraging by a system of liberal grants-in-aid. Consistently with the educational policy of the State, the education of backward communities has been systematically encouraged by the grant of special concessions".

Endowments for education, though not common, were not altogether absent. In 1103 M. E. the Government accepted a legacy of Rs. 20,000 left by the late Dewan Bahadur Sir P. Rājagōpālāchārī, a former Dewan of Travancore. An endowment by Mr. T. Padmanābha Rao for providing mid-day meal for a number of poor boys in the Śrī Mūla Vilāsam School was also accepted.

The remuneration payable to teachers received attention. The report of the committee which was constituted in 1101 M. E. in pursuance of a discussion in the Legislative Council to devise means for the enhancement of the salaries of teachers in the vernacular schools and of grants-in-aid to teachers in such schools was considered by the Government, and the Legislative Council voted an additional grant of Rs. 2 lakhs in 1103 for making a suitable revision of the salaries.

The accession of H. H. the Mahārāja Śrī Chithirā Thirunāl heralded a spontaneous outburst of educational activity. The policy which was being pursued for more than a century by His Highness' illustrious predecessors and which almost reached its culminating point in the reign of Śrī Mūlam Thirunāl Mahārāja had brought education to the very doors of the people in all parts of the State. Among the nation building activities in Travancore education occupies the most prominent place. In no State or Province in India is so much done for the spread of vernacular education. The number of English schools and colleges in Travancore is also phenomenal. The figures relating to female education form a commendable record. The incentive given to the education of conservative classes like Muhammadans and of backward communities like Pulayas and Parayas are also remarkable. During the last few years the Government of H. H. the Mahārāja has been paying great attention to the opening up of all avenues of honourable ambition to all classes of the subjects. But the growth of population has been responsible for the increase of unemployment. The Travancore

Unemployment Enquiry Committee observed in their Report:—"A problem so serious and far reaching in its effects should not be treated lightly as it is sometimes the fashion to do. There is no need to apportion blame for the emergence of this problem. As we have tried to show, the educated classes, the educational authorities, the capitalists and employers of educated labour and the Government are all more or less responsible and none of them can shirk their share of responsibility in solving the problem. We need hardly say that the recommendations which we make in this chapter depend for their success on the active and earnest co-operation of these bodies. Our recommendations, it may be noted, are designed both to relieve the present distress and to prevent unemployment becoming a matter of serious concern in the future. It is, however, not easy to separate and keep apart these two aspects of the matter." The scheme of education in the State required modification. His Highness' Government indented on the services of Mr. R. M. Statham and commissioned him to investigate the whole question with the help of a committee and formulate definite proposals.

The Education Reforms Committee appointed towards the end of 1932 was directed to enquire into the present educational system of the State and advise the Government as to the reforms to be effected in it. A detailed list of the subjects for consideration by the Committee had already been drawn up by a preliminary committee. The Statham Committee made the following preliminary observation. "In Travancore State, Government 'is in a favourable and strong position with regard to the control of education generally. The power of recognising and withdrawing recognition from all classes of institutions vests with the Government or its departmental officers. The power of regulating grant-in-aid and of thereby insuring efficient standards vests with Government or with its departmental officers, Government also has the

right, through its departmental officers, to inspect all recognised institutions. In addition to the possession of these powers, the Government itself is directly responsible for the management of nearly one-third of the educational institutions in the State."

The Committee continued :—"We regret to have to state that, from the evidence before us, it would appear that Government have not always paid sufficient attention either to the laying down of a sound educational policy or to the supervision of the policy being pursued by the Education Department. In spite of conferences held from time to time and in spite of the recommendations of various committees, there are a number of important matters, connected with educational administration, upon which no final action has yet been taken ; and it would appear that the Government has found it difficult to arrive at decisions and take action on many matters which were long over-due for settlement. The introduction of compulsion, the levy of an educational cess, the revision of curricula and the wasteful provision of rival and overlapping schools, for example, are all matters which have been under consideration for a number of years. Delays and lack of decision have been partly due, in our opinion, to the system of the administration under which the Director of Public Instruction does not appear to have had a ready and frequent access to the officers of the Secretariat and the Head of the Administration. From the evidence we have before us, we are satisfied that, in the past, the Director of Public Instruction has not had sufficient opportunities to discuss matters of educational policy personally with the officers responsible for passing final orders. Such personal discussions are, in our opinion, essential both to expedite urgent departmental business and to arrive at agreed decisions on policy. We consider also that, under a system of administration which places the Secretariat officials between the Director of Public Instruction and the Head of the Administration, a more experienced

and senior officer than an Assistant Secretary should be responsible for criticising the recommendations of the Director of Public Instruction."

Among the recommendations of the Committee were the following:—

1. The establishment of an Advisory Board for education.
2. The revision of the Education Code, the amalgamation and reorganisation of the Inspectorate including the appointment of Divisional Inspectors and Assistant Divisional Inspectors.
3. The restriction of admission to pre-university classes.
4. The general encouragement of athletics, financial stability, the audit of school accounts by registered and approved auditors, the recruitment of trained teachers, the payment of minimum rates of pay to teachers, written agreements between managers and teachers, the establishment of provident funds, provision for medical inspection, maintenance grants up to seventy-five per cent. of the deficit, grants for hostels, purchase of play-ground and physical training, grants for the erection, extension, repairs and improvements of buildings, full compensation for fee concessions, grants for author's fees, grants for leave salaries of permanent teachers, the accumulation of limited and audited reserve funds, and, the minimum attendance for earning grants.
5. The abolition of vernacular middle schools and the reorganisation of vocational bias schools.
6. The abolition of the distinction between boys' schools and girls' schools at the primary stage.
7. Co-education to be introduced throughout the primary stage with the exception of Muhammadan girls' schools.
8. Mixed staff to be recruited in the primary schools, women teachers mainly handling the lower classes.

9. Primary education to be free up to and including the 5th class.

10. The introduction of courses in domestic science, music and drawing in the English schools for girls.

11. Encouragement of Technical Education.

12. Depressed Classes—the special supervision by the Inspectorate of the needs of the depressed classes, the insistence on the presence of depressed class pupils in the ordinary schools, the improvement of the present schools in depressed class areas, the recruitment of teachers from the depressed class communities, the provision of fee concessions and scholarships in colleges and an increase in the number of scholarships in secondary schools, financial assistance by way of equipment, clothing and feeding grants to the absolutely poor students in primary schools, and the payment of increased grant-in-aid in proportion to the number of depressed class pupils found fit to read in the 5th class.

13. The reorganisation and improvement of the training schools.

14. The provision of land by the Government for the establishment of more agricultural colonies.

15. The enforcement of the rules regarding the employment of children in factories.

16. The establishment of an Employment Bureau.

While recognising the value of higher education, the Committee recommended a more varied type of education to counteract the tendency of the present system which leads only to very limited channels of occupation, and, in many cases, to reduce the wage-earning capacity of pupils who, without higher education, would normally have earned a livelihood by manual and artisan employment. It must, however, be recognised that, in times of depression, the supply of labour for all forms of employment exceeds the demand.

In the light of the views expressed in both Houses of the Legislature the Government passed final orders

accepting such of the suggestions of the Committee as were deemed practicable and expedient. It is not necessary to give the details. A few facts may, however, be stated. The head office of the Director of Public Instruction was reorganised and strengthened. Provision was made for internal check on receipts and expenditure by the appointment of a Financial Assistant to the Director. The Inspectorate was reorganised. An Advisory Board, consisting of twenty non-officials with the Director of Public Instruction as Chairman was established. Overlapping of primary schools has been eliminated. Unsatisfactory and incomplete primary schools were abolished. The principle of co-education has been adopted and mixed staff in primary schools has been sanctioned. Provision has been made for the encouragement of games. Game fees have been made compulsory in all departmental schools for boys, while greater facilities are being given for grants in private schools. Rules regulating the award of grants to private schools and colleges in aid of games and athletics and for the purchase of play-ground have been sanctioned. The main recommendations regarding Muhammadan education and depressed class education have been accepted. Action has been taken to prevent the irregular payment of teachers' salaries in private schools. The compulsory audit of the accounts of all private English schools by registered and approved auditors and the payment of the auditors' fees have been sanctioned. The principle of restriction of admission to the colleges has been accepted. Increased provision has been made for the training of teachers by the enlargement of the L. T. Class and the opening of two new training schools. The inspection of training schools by the staff of the Training College has been accepted. A committee of experts was constituted to advise the Government on questions connected with higher technical education.

In this programme the interests of special education and the education of backward communities have been

distinctly recognised. The policy, however, may here be stated.

Special schools: -With a view to secure trained teachers or the schools in the State the Government undertook to contribute for the maintenance of Garthwait's Normal School at Cananore in 1037 M. E. (1861-62). A Normal School was opened in Trivandrum in 1042 M. E. (1866-67). This institution which supplied sufficient number of teachers was closed in 1047 M. E. (1871-72). A new Normal School for training teachers for the English schools was started in 1070 M. E. (1894-95) and another for training teachers for the vernacular schools in 1083 M. E. (1907-08). The training course in these schools covered two years, at the end of which the teachers had to undergo written as well as practical examinations. There were two grades of examinations for the English school teachers, viz., the High School Manual Certificate Examination and the Middle School Manual Certificate Examination. Similarly, there were the Lower and the Higher Vernacular Certificate Examinations for the vernacular school teachers. Private training schools also came into existence. Six more departmental lower grade training schools for male teachers were opened in different centres in 1089 M. E. (1912-13).

A special school for the children of Āṛajas and Kōil Thampurāns was opened at Māvēlikara in 1047 M. E. (1871-72). Three more schools specially intended for the children of Āṛajas and other political pensioners were opened subsequently. A departmental special school for the use of Malayāli Brahmans was started in Kuḷakkaḍa in 1101 M. E. (1925-26) and it had forty two students at the end of that year.

Muhammadans:—Pointed attention was directed to the education of Muhammadan boys and girls in 1914-15. Special fee concessions were granted to them. Full salary grants were allowed to Muhammadan primary schools. Arabic Munshis were appointed in the Elementary schools in 1090 M. E.

(1915-16) to teach Arabic as a Second Language. The appointment of a Muhammadan Inspector of Schools was sanctioned in 1918-19. Six Muhammadan vernacular schools for boys were opened in 1923-24, and their number was further increased in the next year. For the first time a Muhammadan girl passed the Vernacular School Leaving Certificate Examination and entered the College for Women for further studies in 1925-26. Although the special concessions granted led to a steady increase in the number of Muhammadan boys in the schools, the proportion of girls attending schools was still disappointing. With a view to remove this defect through effective propaganda work, a Muhammadan graduate was recruited as an Assistant Inspector of Schools in 1933-34. As a result of his efforts there was a phenomenal increase in the number of Muhammadan girls who joined schools during that year. In 1110 M. E. (1934-35) sanction was accorded to the teaching of Arabic in all mixed primary schools. Five Muhammadan girls sat for the Lower Grade Arabic Munshi's Examination, of whom four came out successful, and a Muhammadan lady graduate was deputed for training in the Lady Willingdon College, Madras. In 1935-36 a scheme was sanctioned for securing the co-operation of Muslim associations in different parts of the State by means of grants-in-aid for doing propaganda work to increase the number of Muhammadan girls in the primary schools. Eighty six associations undertook to work for the purpose. The result was that the number of Muhammadan girls attending schools rose from 4,853 in 1933-34 to 6,052 in the next year and to 10,450 in 1935-36.

The following table illustrates the progress of the education of Muhammadans during the years 1100 M. E. to 1111 M. E.

Muhammadans.

Year	No. under instruction.	Schools providing instruction in Arabic.
1100	16,351	131
1101	16,381	140
1102	16,752	155
1103	17,900	175
1104	18,378	184
1105	19,269	188
1106	19,568	190
1107	21,080	} *
1108	21,330	
1109	23,493	217
1110	25,273	230
1111	31,550	253

Sanskrit schools.—A Sanskrit school was started in Travandrum in 1064 M. E. It was originally under the Director of Vernacular Education, but in 1069 M. E. the Principal was placed directly under the Government. There were sixteen Sanskrit schools in 1933 with a total strength of 2,051 pupils. Two of them were Vēdic schools. The Sanskrit schools contained provision for a Kāvya course of six years leading to the Śāstri Examination conducted by the Government.

The Reformatory.—The education of juvenile criminals was taken in hand in 1069 M. E. A Reformatory School at Pūjapūra was established under Regulation IV of 1069 and placed in the charge of an officer who was sent to the Chingelpet Reformatory to study its management. Five years later the system of giving marks and work money was introduced in the school. In 1083 M. E. (1907-08) the rules were revised and the administrative control of the institution was transferred from the Superintendent of the Central

* Information not available.

Prison to the Inspector of Schools. The control was again transferred from the Inspector of Elementary Schools to the Director of Public Instruction in 1089 M. E. (1913-14). From 1925-26 the inmates are given, in addition to elementary education, instruction in printing, book-binding, drawing, agriculture, gardening and music. Spinning was introduced in the next year. Moral and physical instruction also received adequate attention. In 1108 M. E. (1932-33) the after-care of the ex-juveniles released from the Reformatory School was entrusted to the Humanitarian Co-operative Society with a per capita grant of Rs. 3½ per mensem for every juvenile maintained by the Society.

Recognition was granted for the first time to two nursery schools and one Kindergarten school under private management in 1935-36.

Nearly half a century ago the facilities provided by the Government of Travancore for the education of the backward classes attracted the notice of Lord Wenlock, Governor of Madras, who visited the State. His Lordship observed: "I know this country, like every country, has to deal with the lower and more degraded classes of people, and I am glad to see they are not going to be left behind in the race of life. I sincerely hope and trust that the steps that are now being taken may be able to raise them to a position of comparative affluence and happiness. I am glad to see His Highness is taking steps which will eventuate in raising the general level of the whole country".

A number of schools were established for the benefit of the backward classes in 1070 M. E. (1894-95), and in the next year pupils of the backward classes were given scholarships to enable them to prepare for the Vernacular Elementary Examination. Within the next ten years four normal schools were opened at important centres to train teachers for the schools of the backward classes, of which there were

as many as 250 in 1082 M. E. (1906-07). While accepting the responsibility for imparting free primary education to all children in the State, the Government ruled that in regard to the schools in which the majority of pupils came from the specified backward classes the entire cost of primary education should be borne by the State and that where no separate agencies existed for extending the benefit of education to these classes, the Government should employ their own agency for the purpose. The Sirkar schools were thrown open to Īlavas and other backward communities in rapid succession and this had the effect of stimulating the Īlava community to send larger numbers to the schools. One of the most important changes effected in 1087 M. E. (1911-12) was the removal of the restriction on the admission of Pulaya boys and girls into the departmental schools. This reform for the benefit of the untouchables was effected in Travancore before it was attempted in any other State. This is a striking proof of the generous policy pursued by H. H. Śrī Mūlam Thirunāḷ.

Special efforts were made in 1917-18 to increase the number of pupils belonging to the backward communities. Young men belonging to the particular classes who had completed a course of study in the 6th class of a vernacular school or Form II of an English School were recognised as teachers for the 1st and 2nd classes. Private rural schools were encouraged. A scheme was prepared for the partial recognition of schools. A single teacher was allowed for classes 1 and 2, provided the total strength of the classes did not exceed thirty. The half-fee concession was extended to Marava pupils. Conferences of Range Inspectors, Assistant Inspectors, Headmasters of higher grade vernacular schools and leaders of backward communities were held in various centres. In 1924-25 the minimum strength for grant to schools for particular classes was reduced to fourteen and a system of grant-in-aid proportionate to the strength of the classes was sanctioned. All schools in the State except

seventeen were opened to all communities. Poor and deserving candidates of the backward classes appearing for the public examinations held by the department were exempted in 1102 M. E. (1926-27) from payment of the prescribed examination fees.

As a result of the persistent efforts of the department for the educational uplift of the backward classes it may be said that at present there are no special schools for the backward classes. In the Annual Report of the Education Department for 1928-29 the Director of Public Instruction said:—"The exigencies of the times have gradually brought into existence schools which exist specifically for the education of pupils from particular classes. The justification for such institutions has been found either in the outlook of the communities served, which are reluctant to agree to any system of education unless it is tempered by views akin to their own religious and social aims, or in the difficulty of reconciling other communities to the education of their children in the same school with the children of the special communities. Happily, the difficulties of the second kind have now virtually disappeared from Travancore". A necessary condition for the recognition of a private school by the Education Department is that it should be open to all classes. There is thus no ground to fear that the admission of pupils of particular classes into a departmental or private institution will be resented or resisted by pupils of other castes or their guardians. The spread of education among the Īlavas is well sustained as illustrated by the steady increase in the number under instruction in the recognised schools. There are Pulaya and Paraya pupils not only in vernacular schools but also in English schools. Consistently with the liberal policy of the State the education of the backward communities is being systematically encouraged by the grant of special facilities and concessions to pupils and students belonging to those communities.

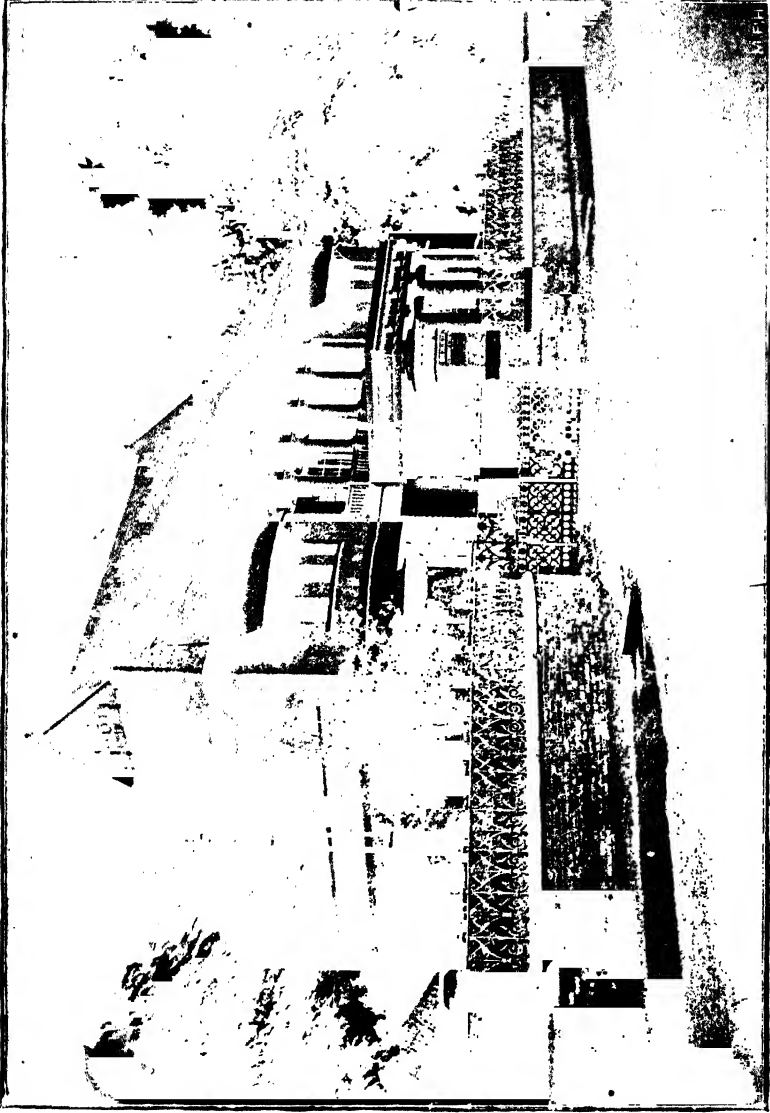
The Education Reforms Committee, in dealing with the question of the education of backward classes, observed that while in almost all the British Indian Provinces there are separate departmental organisations to look to the general needs of the backward classes, in Travancore the Protector of the Backward Communities had practically no connection with the schooling of the backward class pupils, and that there were only certain fee concessions and scholarships provided for such pupils. They recommended the appointment of two Assistant Inspectors to watch the development and needs of backward class education and to maintain up-to-date and accurate statistics regarding the same, the recruitment of backward class teachers to the ordinary schools, particularly departmental primary schools, the giving of tangible recognition to the efforts made by the teachers to retain and promote backward class pupils and assisting the backward class pupils with equipment, clothing and feeding grants.

The total number of pupils belonging to the backward classes, comprising Pulayas, Parayas, Kuravas, the hill tribes, etc., undergoing instruction during 1111 M. E. (1935-36) was 31,259 including 9,711 girls, distributed as shown below :—

Colleges.	8
English schools.	2,667
Vernacular schools.	28,584
Total.	<hr/> 31,259

In that year a grant of fourteen chukrams was sanctioned for each pupil of such communities reading in the 3rd and 4th classes of all recognised vernacular schools in the State. The Administration Report of the State for the year 1935-36 says :—

“As many as 60 Harijan schools for the education of the backward communities were started by people and



The Law College.

associations interested in their uplift, and the question of giving them recognition and grant-in-aid was under the consideration of Government. The Harijan Hostel in Trivandrum, which is a private boarding home for pupils belonging to the backward communities, was given a grant of Rs. 1,200 during 1111 M. E. as against Rs. 300 granted in 1110 M. E."

The work of overhauling the educational system is being pushed on with vigour by the conjoined efforts of the Government and numerous private agencies. But as pointed out by the Sadler Commission Report, "The education of a people is not given by the schools and colleges alone. Other influences blend with them, the spirit and temper of the community which they serve, the power exerted over its thought and character by prevalent aspirations and beliefs, the tone of its family life, the rules and restraints imposed by social organisations, the conditions under which its daily work for livelihood is done". In order to achieve this end the work of educational institutions has to be supplemented by other agencies suited to the times. Adult education and the provision of facilities for free social intercourse are essential preliminaries to the attainment of social solidarity and a well-regulated political consciousness. The agencies which are interesting themselves in this work of nation building are not many. The object of sectarian organisations, notwithstanding their diversity of outlook, converge on this point. Some of the institutions which are being encouraged by the Government deserve a brief notice.

The Collegiate Hostel in Trivandrum provides accommodation for over one hundred students. There are also separate hostels attached to the College for Women and the four private colleges in the moffussil. Besides these there are private hostels or boarding houses which are aided

Hostels and
Boarding Houses.

by the Government, three of them being women's hostels and one a free boarding house for students belonging to the backward communities. As regards English schools, two departmental special schools, viz., those at Māvēlikāra and Kuḷakkāḍa, have boarding arrangements for the students. Thirty private English schools also have boarding houses attached to them. 383 students were residing in the boarding houses attached to seven private vernacular schools in 1935-36, while thirty seven boarding houses attached to private girls' schools contained 1,411 inmates. Ten private school hostels received grants-in-aid from the department.

A new scheme for the medical inspection of pupils in the colleges and English schools was sanctioned and brought into force during 1922-23. The medical inspection of pupils in all the departmental schools and a few private schools was conducted in 1925-26. On the recommendation of the Education Reforms Committee the possibility of extending medical inspection to children in the vernacular schools was investigated in 1109 M. E. (1933-34). A scheme for the proper medical inspection of all children in the primary schools by the Public Health Department was approved by the Education Advisory Board and submitted to the Government. It was sanctioned by the Government and put into operation in 1935-36. The work was started in eight representative taluks. Regarding the arrangements made for the purpose, the Annual Report of the Public Health Department for the year says:—"Eight Sub-Assistant Surgeons borne on the staff of the Medical Department were selected for the work and transferred to the Public Health Department. Supervision of the work was entrusted with the controlling agencies in the Education and Public Health Departments. The Sub-Assistant Surgeons selected were given a course of practical training in the Health Unit, Neyyāttinkāra and in the Specialists' sections of the General and Ophthalmic

Hospitals in Trivandrum. They were able to conduct medical inspection in 200 schools, the total number of students examined being 28,769. Of these 14,402 students were found defective and 10,392 of them were treated". Regular annual medical inspection of the pupils in all the colleges and recognised schools is being insisted upon.

The Boy Scouts Movement, the fundamental principles of which are self-respect, faithfulness, helping others, sympathy, modesty, kindness to animals, obedience, good spirits, thrift, physical and mental cleanliness, was introduced in the State in 1917-18 and steps were taken to organise it in the next year. A Boy Scouts Association was formed in 1924-25. It is mainly financed by the Government. His Highness the Mahārāja became the Chief Scout in 1928-29. The Education Department began to encourage the formation of Scout troops and in 1105 M. E. the movement spread to North, Central and South Travancore. It has since been placed on a well-organised basis. H. H. the Mahārāja is the Patron of the Travancore Boy Scouts Association and H. H. the Eḷaya Rāja the President. Dewan Sachivōḥama Sir C. P. Rāmaswāmy Aiyar is the State Commissioner and Chairman of the Headquarters Council. The State is divided into eight districts with headquarters at Nāgercōil, Trivandrum, Quilon, Māvelikāra, Thiruvalla, Alleppey, Kōṭṭayam and Munnār. There are besides an Assistant State Commissioner, an Organising Secretary and a Treasurer. Steps were taken in 1935-36 to improve the efficiency of the scout troops in the English schools and teachers of vernacular schools were deputed for training in scouting. The number of troops at the end of 1935-36 was 2,117 consisting of 1,230 scouts, 822 cubs and 65 rovers.

The Girl Guide Movement is also popular in the State, H. H. the First Princess being the Chief Guide.

In 1038 M. E. (1862-63) there were two libraries for the people in Trivandrum and the circulation of English and vernacular newspapers and periodicals was visibly increasing. Two years later two reading clubs were opened in the town and were maintained by private subscription.

Thirty seven well-organised reading rooms and libraries were in receipt of grants during 1917-18. The inspection of reading rooms and libraries for purposes of grant was transferred from the Assistant Inspectors of Vernacular Schools to the Assistant Inspectors of English Schools from the beginning of 1928-29. A scheme for the establishment of a Central Circulating Library and a large number of rural library units was submitted to the Government towards the beginning of 1110 M. E. (1934-35) and the Government sanctioned the proposal of the Director of Public Instruction to open rural libraries attached to departmental primary schools in fifteen centres in each educational division. The scheme was put into practice in 1935-36. The Annual Report of the department for the year says :—"Sixty libraries were accordingly started, 57 being Malayālam libraries and 3 Tamil libraries. An allotment of Rs. 100 was made for each library for furniture. The Headmasters of the primary schools where these libraries were started were made the honorary librarians each of whom was assisted in his work by a local committee of three members. The librarians were paid Rs. 3 each for library work. A set of 200 books was purchased and supplied to each library. Besides this, 4,700 books were distributed from the office of the Text Book Committee free of cost. A daily newspaper and a magazine were also supplied to each library. The movement was greatly appreciated by the local people."

But the reforms effected peacefully ceased to satisfy the aspirations of the people and failed to translate into accomplished fact the liberal intention and the avowed policy of the Government. The

Co-ordination of
education with the
means of living.

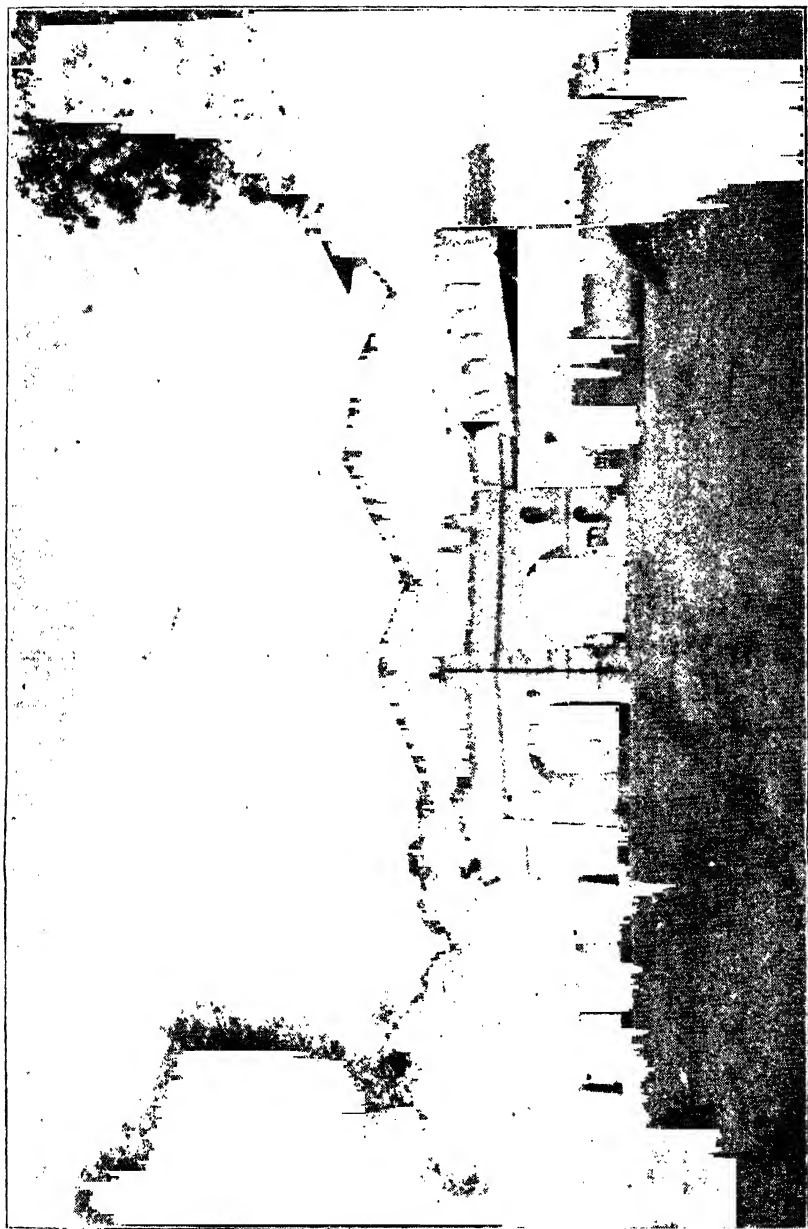
co-ordination of education with the means of earning livelihood, which trains the eye and the hand along with the intellect, while it raises the altitude of science and culture and broadens the base at the same time, was recognised to be a problem of great importance and urgency. This aspect was clearly explained in a presidential address delivered in H. H. the Mahārāja's College of Science by the Dewan, Sachivōt'nama Śrī C. P. Rāmaswāmy Aiyar.

"Why do I insist so much on the technological side? Let me go back from all these dreams to immediate practical points. This country of Travancore has an area of nearly eight thousand square miles. Of that 8,000 square miles, over 2,500 miles are taken up by backwaters and forests and uninhabitable regions. In the balance is aggregated a population of five millions. You cannot, if you would, grow food enough for all your people here. You must buy your rice from outside, unless intensive agriculture and the results of research enable you to be self-sufficient in that respect. Thus the problem of Travancore is a problem of feeding, keeping alive on the right standard of life, a great population within a limited area. That can only be done if science and what science can do for man are utilised to the full. If, for instance, the hard timber and the soft woods, of which our forests are full, are used for the multiform uses of the world, if, for instance, you make your own clothing not out of cotton, because you cannot grow cotton, but out of a substitute for cotton, and you make your own food by intensive cultivation, you develop yourselves and grow yourselves the things that are essential for daily life out of the products of your own place. If not, you must produce enough to sell. The thing is obvious. If you cannot produce your food, drink and clothing, you must produce enough to sell in order to get these things. And for that purpose also science and the utilities of science are an absolute essential. In a sense and to a degree unparalleled elsewhere, perhaps in India, you are driven back to this proposition

that unless you equip yourselves for the fight in the competition of the world, you will be nowhere. This world, unfortunately, is a competitive world. The weakest goes to the wall. The victor has very little sympathy for the vanquished. Therefore, Travancore must follow the example of other thickly populated regions of the world. Denmark, Switzerland, Holland, Greece, these are our examples. Look at Holland; a very infertile soil, uninhabitable climate, a thick population, very little of natural resources and yet, by the aid of dynamic will, by the aid of scientific equipment, they have wrested the earth from the sea. They have created a school of agriculture and of horticulture for the envy and for the admiration of the world. They are not only self-sufficient for themselves but they are great exporting nations. Denmark is even more poor in everything that counts for material prosperity than Holland and yet, by a system of co-operative enterprise, by a system of mutual trust and all-round organisation, Denmark to-day is probably the most prosperous nation in Europe. These nations like Denmark, Holland, Sweden are the only happy places in Europe to-day. It is not England, it is not France, it is not Germany, nor is it Russia that are happy, contented, prosperous; it is these small nations, because of their very smallness, because of the homogeneity of their population, and homogeneity of their ideals; because they have realised that science and the efforts of science and the labours of scientists meant much and must be harnessed to the efforts of daily life. Thus, therefore, it is up to Travancore to do the same and to prosper”.

This ideal could not be accomplished if the connection with the University of Madras was maintained. That University would, it was explained, be a part of the educational organisation of the Province of Madras—a part and appendage of the work of the Department of Education. The Government

Travancore
University.



University Buildings.

realised that the time had come for the establishment of a separate independent university for Travancore. The idea of a Travancore University was an old one. The Indian Education Commission of 1882 suggested the possibility of Trivandrum becoming in course of time the centre of a new university. In 1902 Mr. R. S. Lepper, Professor of History and Economics, stressed the idea before the Raleigh Commission. The late Rev. Dr. William Miller was the sponsor of that idea. But it was thought that the time had not come for trying the experiment. In the early years of this century the proposal for establishing universities in South India on a linguistic basis gained considerable popular support. In 1912 Dr. A. C. Mitchell, the Director of Public Instruction in Travancore, expressed himself in favour of it. The demand was taken up by the Press. In 1914 Mr. L. C. Hodgson, Principal of the College, who had in him the idea of starting Honours courses in His Highness the Mahārāja's College, foreshadowed the need of a university. It was not merely a local problem; for, we find Sir Harold Stuart, member of the Madras Executive Council, advocating in 1915 the formation of a university for the west coast. Mysore had by that time taken a forward step and established its own university. The policy of the Government of India in favour of multiplying universities throughout India was expressed by Lord Hardinge in laying the foundation stone of the Benares University in 1916. The Travancore Government saw that the problem of higher education in the State demanded a careful solution. "Despite the large amounts spent by the Government in providing accommodation in the colleges of Travancore, students were obliged to seek admission to institutions outside the State after the local colleges had been filled to overflow". The admission of Travancore students to the Engineering, Agricultural and other professional colleges in the Madras Presidency was becoming difficult. Dewan M. Krishnan Nayar therefore claimed that the pre-eminence

of Travancore in the matter of education and the magnificent record of educational progress which the reign of His Highness the Maharaja Sri Mulam Thirunāl had witnessed would justify the establishment of a university for the State. The Government appointed a Committee in 1916 to consider the question. On the Committee submitting their interim report in favour of a university of the unitary residential type, the Government decided that action on the recommendations of the Committee should be deferred pending the changes likely to be introduced in the Madras University consequent on the findings of the Calcutta University Commission. The publication of the Saddler Commission Report and the reforms undertaken by the University of Madras were in the direction of a teaching university at Madras and the establishment of other universities in selected centres which might be found suitable. The Senate of the Madras University passed a resolution that "the demand for liberal education in the Presidency should be met by the establishment of more universities and by the re-distribution of the territorial area of the existing universities so as to provide as far as possible at least one university for each principal linguistic area". The Madras University Act of 1923 legalised a differential treatment between the Madras colleges and the moffussil colleges. Travancore felt that the diversion of funds of a whole university to the benefit of a single centre was unfair. She entertained the legitimate apprehension that her educational institutions would be reduced to a position of inferiority through the practical ineffectiveness for the adequate representation of moffussil interests in the governing bodies at Madras.

The question of the Travancore University was taken up in the Travancore Legislative Council by a resolution moved by Mr. T. K. Velu Pillai a non-official member, for the immediate establishment of a teaching and residential university in Travancore. The Government accepted the resolution and appointed a Committee in 1923. The Committee was

composed of members elected by the Legislative Council as well as some of the eminent educationists in South India. Its chairman was the late K. A. Krishṇa Iyengār, the Deputy President of the Legislative Council, while Rao Bahadur K. V. Rāngaswāmi Iyengār who had a long and intimate association with the University of Madras and large experience of matters educational in Travancore and South India was the Convener. The Committee submitted an elaborate and comprehensive report recommending the establishment of a university in Travancore of the federal type. They accepted the principle that the university should, if possible, function for the whole of Kēraḷa—Travancore, Cochin and Malabar. But they held that, whether the other states joined or not, a university for Travancore with its headquarters at Trivandrum should be established. No action was taken on the report until 1936, when the Government resolved upon a thorough overhauling of the system with a view to a new sociological reorganisation of education. The Committee was directed to re-examine generally the conclusions and recommendations of its predecessors in the light of such changes in the conditions within and without Travancore as had taken place since the *ad interim* report was submitted and to formulate a fresh scheme for a university for the State by itself or in association with adjacent areas. This Committee submitted in December 1924 a very elaborate and comprehensive report after a full consideration of the recommendations contained in the Sadler Report in so far as they were applicable to local conditions. By reference to facts and figures relating to literacy, the extent of secondary education, the number of high schools and colleges, the number of under-graduates, the variety of the courses and subjects in which work of the highest standard according to the curricula of the Madras University was being done, the Committee showed conclusively that Travancore, taken by itself and without including other parts of Kēraḷa, was in a much stronger position when

compared with Mysore when the University of Mysore was started in 1916, or with other new universities, such as the Andhra or Nagpur, which had been started or were proposed to be started at that time. They were therefore unanimously of opinion that a separate university for Travancore was both desirable and feasible. They recommended a federal type of university organisation in which all the colleges would have equal rights in the management of the university and would obtain representation in proportion to their size and resources. In the event of a Kēraḷa University being created, they recommended that Travancore, Cochin and Malabar should each have a recognised university centre at which the constituent colleges of arts and science should be concentrated. If, however, the university were confined to Travancore, they proposed that the colleges composing the university should all be located in the same place. For various reasons which need not be detailed at present, no action could be taken on the recommendations of this Committee. Since then two of the four second grade moffussil colleges in the State became first grade colleges securing affiliation in Pass Degree courses in certain subjects.

The Education Reforms Committee appointed in December 1932, while strongly recommending the development of technical and technological education with a strong practical bias and the establishment of a College of Technology, also pointed out that the disadvantages of remaining within the Madras University outweighed the advantages and suggested that the future programme of the Government with regard to collegiate development should be so framed that it would ultimately become possible to establish a separate university for Travancore.

The reorganisation of secondary and collegiate education had become an important necessity in view of the acutely growing problem of middle class unemployment and of the policy of vigorous and rapid industrialisation initiated

by Dewan Sachivōṭhama Sir C. P. Rāmaswāmy Aiyar. In the course of a speech the Dewan gave an authoritative and comprehensive exposition of the need for a Travancore University, and of its ideals and aims. He said: "Apart from the economic necessity for a university there is a great political and practical necessity also. I foresee—and as an administrator I cannot but foresee—that middle class educated unemployment, which is every day on the increase, will necessarily lead to a situation which will be intolerable. If the state of things is not dealt with in time, the troubles which certain European countries are now suffering from, which Bengal is suffering from, would be the result here too. There is therefore also a great political necessity for reorganising our system of education."

The conditions were thus favourable to the establishment of a separate university for Travancore. The people of the country had been evincing a growing attachment for Malayālam literature and Kēraḷa art and culture and in their desire for the conservation, development and enrichment of their cultural and literary traditions had been agitating for the establishment of a university which "would not only be the custodian of Kēraḷa culture but would supply the intellectual force required for the progressive interpretation and development of that culture." The State possessed ten colleges which were affiliated to the Madras University and of which six were maintained by the Government at Trivandrum and four by private managements in the moffussil. Their total enrolment during the academical year 1936-37 was 2,975 and the total strength of the teaching staff 214. In Trivandrum there were also several important quasi-educational institutions, such as the Public Library with nearly 40,000 volumes on various subjects, the Museum, the School of Arts, the Observatory, the Department of Oriental Manuscripts, the Palace Manuscripts Library, the Śrī Chitrālayam Picture Gallery and the Department of Archaeology, whose co-operation

and assistance would be available for the university. A considerable number of the men and women working on the staffs of these colleges and quasi-educational institutions had training in famous western universities and possessed high academic qualifications derived from western or Indian universities. A very fair number had also acquired considerable experience as members of the different governing bodies of the Madras University so that the academic and administrative personnel essential for the success of a university in Trivandrum would not be lacking. The total number of Travancoreans who were graduates of the Madras University was not less than that of eight or nine districts of that Presidency. Further, a fifth of the registered graduates on the roll of the Madras University were Travancoreans and there would thus be a large and enlightened electorate.

In view of the favourable conditions mentioned above, His Highness the Mahārāja issued a Proclamation on the 2nd November 1937, the twenty sixth birth-day of His Highness, embodying the Regulation announcing the establishment and incorporation of the Travancore University. The details of the scheme were worked out by Mr. C. V. Chandrasēkharān, Director of Public Instruction, who was placed on special duty.

Ideals, aims and plans:—The following are among the chief ideals, aims and plans of His Highness the Mahārāja's Government with regard to the new Teaching University:—

1. A radical reorganisation of secondary education in the State and a well-considered and well-planned development of technical and technological education as an indispensable part of the policy and programme of educational reorientation, reconstruction and industrialisation undertaken by the Government.

2. The establishment of a faculty of Technology and the creation of gradual development of a Technological Institute which will in the beginning give basic technological

training to a small number of students who have passed the Intermediate Examination taking science as their optional subject, provide Diploma courses in Mechanical Engineering, Electrical Engineering and Motor Engineering and gradually make provision for training for the particular kinds of industries which may grow up in the State as the policy of industrialisation begins to bear fruit and as industry and trade develop after the completion of the Pallivāsal Hydro-Electric Scheme.

3. The establishment of a School of Architecture, admission to the course being restricted to a very limited number of post-intermediate or post-graduate students.

4. The starting of a Diploma course in Geography admission to which will be mainly confined to graduate teachers in the secondary schools.

5. The establishment of a Central Research Institute in Applied Science where all the scientific workers in the various departments, such as the Industrial Chemist of the Department of Industries, the Bio-Chemists, Economic Botanists, Entomologists and Mycologists of the Department of Agriculture and Fisheries, the Pharmaceutical Chemists of the Medical Department, the Water Analyst of the Water Works Department and the Food Analysts and the Bacteriologist of the Public Health Department, will be brought together to work in collaboration with the teaching staff of the Faculties of Science and Technology in the University and where additional sections will be opened from time to time for investigating problems of a predominantly practical character, e. g., the economic utilisation of the forest products, the development of fisheries in the State, etc.

6. The creation of a strong Faculty of Oriental Learning including Sanskrit, Malayālam and Tamil in the beginning, and Hebrew, Syriac and Arabic later on, with provision of facilities for the study of the civilisation and history of Kēraḷa, supplemented by the resources of the departments of Archaeology and Huzur Central Records, as

well as for the scholarly and scientific investigation and research in the evolution and history of Āyurvēda and the pharmaceutical value of Āyurvēdic drugs.

7. Suitable location and housing of the Faculties of Arts, Science, Technology, Law and Oriental Learning in close proximity to one another in the University *campus* and the organisation and integration of the resources of all the component colleges with a view to avoiding wasteful duplication and securing the maximum efficiency and inestimable advantages of a rich and many-sided university life and "university atmosphere."

8. Devising effective methods for enabling the moffussil colleges to participate in the life of the University and to maintain their standards of teaching and examination and making provision for regular and periodical inspection of the moffussil colleges by the University, exchange of teachers between the colleges in Trivandrum and those in the moffussil, inter-collegiate activities, adequate representation of the moffussil colleges in the governing bodies of the University and other similar arrangements.

9. The establishment of a University Library, devotion of proper attention to physical education, promotion of corporate activities by the creation of a University Union, a University Athletics Club and a University Training Corps, formulation of schemes for university extension work and the gradual establishment of a complete residential system.

10. The introduction of a reconstructed school system in Travancore with separate vocational and technical schools giving a specialised training in one or more vocational subjects and providing at the same time a modicum of general education.

Constitution :—The new Teaching University established at Trivandrum will enjoy a considerable degree of autonomy in academic matters, though in matters of policy and finance it will be subject to real and effective control by the Government of His Highness the Mahārāja. The

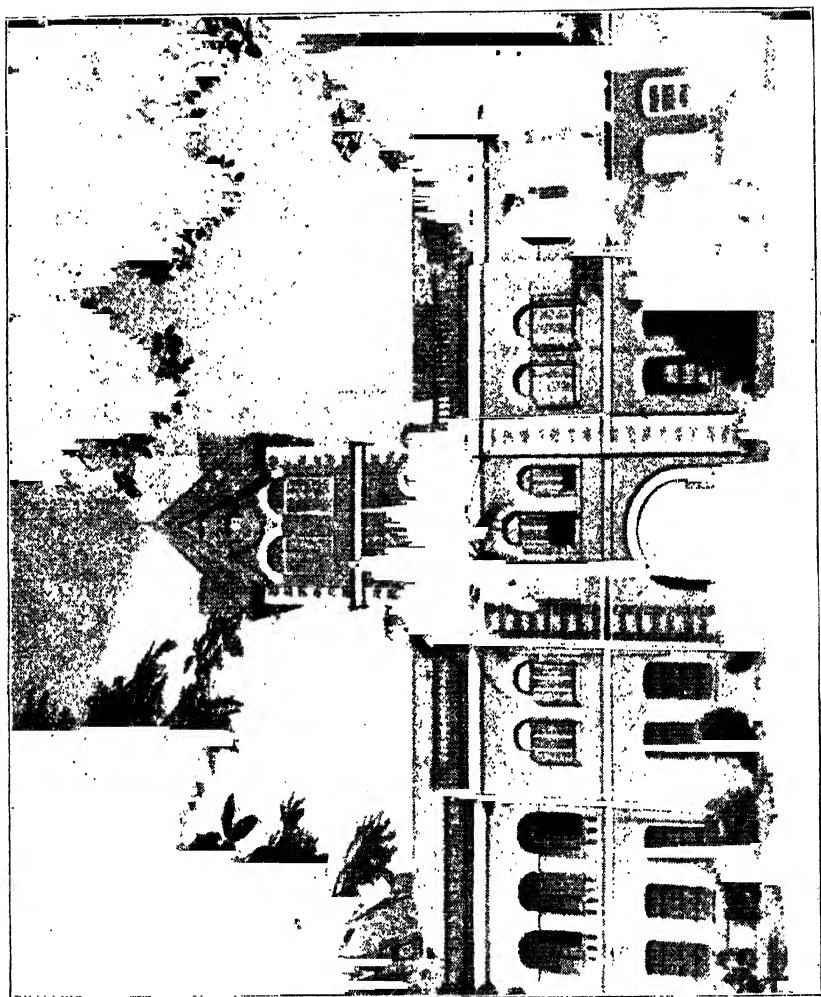
departmental colleges in Trivandrum will be transferred to the University and will constitute the main parts of the institution. The control of the University is vested in the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Syndicate and the Senate. His Highness the Mahārāja is the Chancellor and constitutes the highest authority in the University with full powers of control and direction. His Highness will nominate the Pro-Chancellor and the Vice-Chancellor. The former takes rank and precedence immediately after the Chancellor at all public functions connected with the University, while the latter who will hold office during His Highness' pleasure is the Chief Executive Officer of the University and the ex-officio Chairman of the Syndicate and the Senate. If a part-time officer is nominated as the Vice-Chancellor, the Chancellor may also nominate a Pro-Vice-Chancellor to whom the Vice-Chancellor may delegate such of his powers and duties as he deems fit.

The Syndicate, consisting of twelve members including the Vice-Chancellor, the Pro-Vice-Chancellor, the Director of Public Instruction in Travancore, the Principals of the two moffussil first grade colleges, two selected representatives of the Senate and five members nominated by the Chancellor, is the chief executive body of the University and the ultimate court of discipline subject to the authority of the Chancellor. Five at least of the members should be connected with the profession of education and three at least of the nominated members should be Deans of Faculties. The members other than ex-officio will hold office for three years, but will be eligible for re-election and re-appointment. The higher appointments of the University will be made by the Government on the recommendation of the Syndicate and in accordance with the rules framed on that behalf.

The Senate is an advisory and legislative body with extensive powers in respect of general policy and finance,

subject to the ultimate authority of the Government. There will be about sixty members, the majority of whom will be persons connected with education. Besides the Vice-Chancellor, Pro-Vice-Chancellor, the Director of Public Instruction, the Deans of Faculties, members of the Syndicate who are not otherwise members of the Senate, and the Principals of colleges who are ex-officio members, and about twenty members to be nominated by the Chancellor, there will be five elected representatives of both houses of the Legislature, seven members elected by the registered graduates from among themselves, one member, other than the Principal, elected by and from the teaching staff of each private college in which instruction is given to a university standard and one member, other than the Dean, elected by each of the Faculties. Any association offering to contribute, for not less than five years, Rs. 1,000 or more per annum to the University Fund will be entitled to nominate one representative so long as the contributions continue to be paid. The Chancellor may nominate any eminent person to be an Honorary Member for life and any person who contributes not less than Rs. 10,000 or has transferred property of the like value to the University Fund or the general purposes of the University will be eligible for a life membership. The ordinary members other than ex-officio will hold office for three years, but will be eligible for re-election and re-appointment. The Senate is competent to pass the annual budget, to review the Annual Report, to discuss and pass resolutions on all matters concerning the University and to make fresh Statutes with the approval of the Government.

The Faculties which constitute the purely academic bodies of the University will have no administrative or legislative duties. There will be the Faculty of Arts, the Faculty of Science, the Faculty of Technology, the Faculty of Oriental Studies and Fine Arts, the Faculty of Law, the Faculty of Education and such other Faculties as may be



The Engineering College.

constituted from time to time by the Statutes. The Faculties will be consulted by the Syndicate in all academic matters and will also have the power of drafting ordinances on academic matters for consideration by the Syndicate. Each Faculty will contain from fifteen to twenty members and will be presided over by its Dean, the Principals of the University Colleges being ex-officio Deans of the respective Faculties. The organisation of the teaching work of the University and the prescription of the curricula and texts will be among the duties of the Faculties, the powers of the Deans and the Faculties being defined by the Statutes of the University. Each Faculty will have under it Boards of Studies for the subjects comprised in that Faculty.

There will also be Boards for the Publication and Extension Work of the University and committees for the management of the University Library, the University Law College and matters concerning the residence, welfare and discipline of students. A Standing Finance Committee will maintain the accounts of the University, prepare and work out the annual budget, periodically review the financial position and advise the Syndicate on all financial matters.

Finance.—The necessary capital and recurring expenditure of the University will be met by His Highness' Government. They have undertaken to finance adequately the growing needs of the University from year to year. The provision of a permanent Endowment Fund in course of time is also under contemplation. "The development of technical and technological studies and the diversion of students from literary courses will be the main objective. The supreme importance and urgency of such an objective from every point of view, social, economic, and political, cannot be denied and the Government are therefore prepared to provide, even with some difficulty, the necessary funds for a university scheme which is designed deliberately, and which will endeavour, to achieve that objective".*

* Memorandum :—A University for Travancore, p. 32
by C. V. Chandraśekharaṇ.

Statement showing the number of institutions, pupils and expenditure during the years 1070, 1085 and from 1101 to 1111 M. E.

Year. (M. E.)	No. of insti- tutions.	Pupils.	Expenditure. Rs.
1070	2,816	131,294	2,91,688
1085	1,810	152,645	7,60,364
1101	3,509	480,986	37,44,036
1102	3,583	488,431	39,59,578
1103	3,628	519,288	41,90,581
1104	3,632	545,225	41,75,060
1105	3,641	568,703	42,20,800
1106	3,699	575,713	49,09,579
1107	3,761	604,123	45,14,453
1108	3,810	624,123	45,55,698
1109	3,749	649,368	46,91,483
1110	3,699	674,317	47,23,208
1111	3,638	698,424	46,98,264

Statement showing the distribution of pupils between the departmental and private institutions during the years 1101-1110 M. E.

Year	Departmental		Private		Total	
	Boys	Girls	Boys	Girls	Boys	Girls
1101	150,341	76,984	160,166	93,495	310,507	170,479
1102	146,510	77,384	165,502	99,035	312,012	176,419
1103	153,477	83,984	174,860	106,867	328,337	190,951
1104	160,011	89,359	181,515	114,340	341,626	203,699
1105	164,924	93,468	188,589	121,722	353,513	215,190
1106	161,633	94,615	192,646	126,819	354,279	221,434
1107	166,787	99,460	201,402	136,474	368,189	235,934
1108	172,557	103,985	208,415	142,708	380,972	246,693
1109	176,798	109,575	215,567	147,428	392,365	257,003
1110	178,602	113,175	226,271	156,269	404,873	269,444

BIBLIOGRAPHY.

A memorandum on the Travancore University.

The Dewan's Presidential Address at the Science College Union Day meeting (18-12-1936).

Report of the committee appointed to revise the curricula (1938). • •

Report of the Committee appointed to consider the questions connected with the improvements of Vernacular Education in the State (1914).

Report of the Education Expenditure Committee (1921).

Report of the Educational Scholarships Committee (1923).

Report of the Committee appointed for proposing a revision of the Salaries and grants-in-aid of Vernacular School Teachers (1927).

Report of the Travancore University Committee.

Report of the Sadler Commission.

Report of the Education Reforms Committee (1935).

Administration Reports of the Department of Education.

Proceedings of the Travancore Legislative Council.

Proceedings of the Sri Mulam Assembly.

Proceedings of the Sri Chithira State Council.

CHAPTER XXVII

PUBLIC HEALTH.*

The annals of Public Health Administration in Travancore in the modern sense date back to the first decade of the nineteenth century. The introduction of vaccination so early as 1813 within a few years after its discovery by Edward Jenner, laid the foundation of "Preventive Medicine" in the State. The starting of the European System of Medical Aid in the country during the reign of Her Highness Gouri Lakshmi Bāyi, in the year 1811, preceded the starting of vaccination only by a couple of years. It was under the aegis of the curative system, and as a part and parcel thereof, that the branch of Preventive Medicine in the State had its inception. Among the Indian States, it is the role of a pioneer that Travancore has played in the realm of modern medicine, public health, and sanitation.

Vaccination Department:—It was with the organisation of a separate Vaccination Department in 1041 M.E. (1865-66) that regular efforts for ensuring health were first made and the public health institution in the State crystallised itself. This department was put in charge of a medical officer with European qualifications, who was designated Superintendent of Vaccination and placed under the orders of the Durbar Physician. His staff consisted of a Head Vaccinator and twenty seven Vaccinators in five grades. The Superintendent of Vaccination had to supervise the work of the Vaccinators, inspect the out-station hospitals, treat cases and suggest measures for the improvement of sanitation. This step marked the first stage in the progress of Public Health

+ The Draft was supplied by the Department of Public Health.

work in the State. In 1044 M. E. (1868-69) the Vaccination Establishment was reinforced by the entertainment of eight additional Vaccinators, thus making the total thirty five, this number remaining practically unchanged for more than twenty years. In 1067 M. E. (1891-92) and the three succeeding years, further additions were made to the staff so that at the close of 1070 M. E. (1895) the strength of the Vaccination Establishment rose to sixty four including six Female Vaccinators. The Superintendent of Vaccination functioned as the sole Inspecting Officer up to the end of 1065 M. E. (1890), when two Inspectors were appointed in addition to assist him. A Vaccine Depot was established in 1064 M. E. (1888) for the preparation and distribution of vaccine lymph.

Sanitary Department—The need for a separate and independent Public Health agency having been felt by the Government, a Sanitary Department was organised in 1071 M. E. (1895) with a Sanitary Commissioner as its head. The Government, defined its duties as follows:—
“For purposes of this Department, the whole country is divided into 4 Districts, viz., Trivandrum, Quilon, Kōṭṭayam and Vaikom, and an Inspector will be appointed to each District, whose duty will be (1) to superintend and check the vital statistics throughout the District, (2) to attend to the sanitation of all parts of the District where the Towns Improvement Regulation is not in force, (3) to study and report on the state of Public Health within his District, (4) to superintend the vaccination work, and (5) to be a sort of travelling dispensary, actually conveying medical aid to the door of the villager. The Inspectors will be under the immediate orders of the Sanitary Commissioner. The Vaccinators..... will periodically inspect the registers in the Proverthi Cutcheries within their respective Ranges and check and verify the entries.”

With the formation of the Sanitary Department, the programme of Public Health work in the State, which was

till then confined to vaccination, was extended so as to embrace various other items of high Public Health utility, such as, collection and compilation of vital statistics, conservancy and sanitation in rural areas, sanitation of fairs and festivals, and itinerant medical relief. This remarkable expansion in the sphere of Public Health work brought with it several far-reaching benefits. The crude system of arm-to-arm vaccination which was formerly in vogue was abandoned. An adequate supply of good vaccine lymph was ensured. Better out-turn of work became possible under vaccination. More effective measures against epidemics became easy. The Public Health agency was separated from the Medical Department and afforded the status of a separate and independent entity. Medical relief was rendered available in rural parts. The conservancy establishment was improved and enlarged. The number of conservancy stations and the strength of their staff which stood at 32 and 235 were increased to 39 and 382 respectively. Data regarding births and deaths, infant mortality and principal diseases were made available. The Towns Improvement Regulation which had come into operation in certain principal towns, such as Trivandrum, Nāgercoil, Quilon, Alleppey and Kōṭṭayam, conduced to better sanitation. The work of collection of vital statistics in these important urban areas passed under the administration of the Committees constituted under the Regulation. Regulations and Rules bearing upon Public Health were passed and put into operation.

Commensurate with the increased volume of work assigned to the Sanitary Department, an adequate enhancement was effected in the departmental staff. The Superintendent of Vaccination was transferred to the Medical Department and the posts of the Vaccination Inspectors were abolished, four District Sanitary Officers and a Taluk Sanitary Officer for the outlying taluk of Shenkōṭṭa being newly appointed instead. These officers were medically qualified

men, their duties including medical relief as well. The vaccination staff was augmented by seventeen additional hands, thus raising the number of the Vaccinators from sixty four to eighty one, of whom one was the Head Vaccinator, the others being classified into five grades. The State was divided into numerous Vaccination Ranges. It was made incumbent upon the Vaccinators that they should visit each and every nook and corner of the country according to programmes prepared and sanctioned previously.

On the recommendation of the Vaccination Committee appointed in 1088 M. E. the number of Vaccinators was raised to 117 and that of the Sanitary Officers to fourteen. When a large number of hospitals, dispensaries and grant-in-aid, vydiśālas were opened, the work of itinerant medical relief, which was included among the duties of the Sanitary Department, was dropped, arrangements being, however, made for the distribution of cholera medicines in times of need.

The number of Vaccination Ranges was later increased to 104, the number of Vaccinators being raised to the present strength of 118. The Sanitary Officers were subsequently classified into two groups, viz., District Sanitary Officers and Assistant Sanitary Officers, their total number rising to thirteen including the Palace Circle and the Vaccine Depot. This classification, however, disappeared later, leaving only a single class of Sanitary Circle Officers. Following the reallocation of the Sanitary Circles consequent upon the Retrenchment Committee's Scheme, the strength of the Sanitary Circle Officers was reduced to nine.

The Sanitary Department, in due course, called for further expansion to meet new conditions and altered requirements. The State wanted to fall

New Public
Health Scheme.

in line with the general development of
Public Health organisations elsewhere.

In the post-war readjustment of values, Public Health came

to be recognised as the nation's greatest defence. The world-wide Public Health activities inaugurated by the International Health Division of the Rockefeller Foundation and by the Health Organisation of the League of Nations, symbolised the paramount importance that was newly given to Public Health. The Central and Provincial Public Health Organisations in British India were remodelled in order to make them function more efficiently.

The need for organising a modern Public Health Department to cope with the various Public Health problems of Travancore as effectively as possible, had been engaging the attention of the Government since 1103 M. E. In 1928 the Government requested the Rockefeller Foundation to depute one of their representatives to the State for giving advice in organising a Public Health Department on up-to-date lines. The representative who was accordingly deputed by the Foundation was appointed by the Government as Honorary Adviser, Public Health. A general Public Health Scheme submitted by the Honorary Adviser was considered and a programme of certain select activities was put into operation in 1105 M. E. (1930). This programme consisted of Hookworm Survey and Treatment, Public Health Education, Health Unit work in Neyyāttinkara, Epidemiological and Vital Statistical operations in Viḷavancōde taluk, and Medical Entomology work. These activities were continued as temporary measures from 1105 M. E. onwards with certain additions and alterations, year after year, till the end of 1108 M. E. As a preliminary to the carrying out of this programme, two officers of the Department were deputed to the United States of America to undergo special training in Public Health, and, on their return, they were put in charge of the formation and working of the Neyyāttinkara Health Unit and the Epidemiological and Vital Statistical work in Viḷavancōde.

It was felt necessary, in the interests of an efficient Public Health administration, to effect an amalgamation

of the existing Sanitary and temporary Public Health departments, so that all the activities might be co-ordinated on a proper scientific basis under a single directing agency. The Sanitary Department had been attending only to vaccination, vital statistics and rural sanitation. The unification of the two departments into a new Public Health Department was accordingly given effect to from the beginning of 1109 M. E. / September 1933. The Bacteriological Laboratory under the Medical Department was reconstituted as the Public Health Laboratory. It now comprises several sections, those of the Government Bacteriologist, the Chemical Examiner to Government and the Public Analyst under the Food Adulteration Regulation. The Hookworm Laboratory and the Vaccine Depot are also there.

In 1112 M. E. a further scheme for cholera prevention and for affording intensive Public Health Service was introduced in five select taluks, viz., Shenkōṭṭa, Agasthīswaram, Kalkulam, Viḷavancōde and Thōvāḷa, the first three taluks being in the charge of Sanitary Circle Officers and the last two under Sub-Assistant Surgeons attached to the Medical Department. These taluks are divided into a series of limited Ranges, each Range being allotted to a Sanitary Inspector or a Vaccinator whose duties include intensive vaccination, prompt notification and control of communicable diseases, correct registration of vital statistics and rural sanitation.

For the efficient supervision of field activities, the State has been divided into two Public Health districts, northern and southern, from 1113 M. E., each district being under a District Health Officer who is to exercise intensive supervision over the entire field work pertaining to his district.

Co-operation of the Rockefeller Foundation.—The International Health Division of the Rockefeller Foundation has rendered invaluable services in giving a modern orientation to the Public Health Organisation and its activities in the

State. The invitation extended to them by the Government for deputing one of their agents to Travancore to offer advice on the reorganisation of Public Health work in the country was warmly responded to. Their representative arrived in 1929 and submitted a modern Public Health Scheme after touring the country and making a study of the local conditions and requirements. The working programme suggested as a part of the Scheme was put into operation from 1105 M. E. (1930) onwards, as approved by the Government from time to time.

The representative of the Foundation was working as Honorary Adviser to Government in Public Health since 1104 M. E. (1929). Till the beginning of 1109 M. E., the temporary Public Health Department was under the administrative control of the Honorary Adviser, Public Health, with the help of an Assistant to the Honorary Adviser. On its amalgamation with the Sanitary Department and the abolition of the post of the Sanitary Commissioner it passed under the control of a Deputy Director of Public Health, which post was discontinued by the Government when the Department was again placed under the Director of Public Health in 1110 M.E. The Department has since been enjoying the benefit of the continued co-operation of the Rockefeller Foundation and of the advice of its representatives. The Directors of the Foundation, as also some of its officers working in various parts of the world, have taken occasion to pay visits to Travancore and to express their high appreciation of the Public Health activities in the State.

The Health Unit work at Neyyāttinkara was deriving special support from the Foundation by means of a five-year programme of contributions towards meeting a certain portion of the expenses. The Foundation also awarded four Foreign Fellowships and two Indian Fellowships for higher studies and training in Public Health work, for six of the officers of the Department.

Organisation.—The administration of the Public Health Department is vested in the Director of Public Health.

The immediate supervision of the various field activities devolves upon the District Health Officers of the northern and southern districts. The District Health Officer of the southern district is the ex-officio Medical Officer of Health for the Health Unit, Neyyāttinkara. The Public Health Laboratory has for its head a Superintendent who controls the work of the several sections in the Laboratory, viz., Bacteriological and Pathological sections, Research, Entomological Laboratory, Public Analyst's section, Chemical Examiner's section, etc. The Medical Entomology section has two Assistant Surgeons to attend to the field work, the Laboratory work relating to this section being carried on by the Entomological Assistant attached to the Public Health Laboratory. The Filariasis and Mosquito Control operations and the special investigations on malaria and filariasis are being attended to by Sub-Assistant Surgeons, Supervisors and Field Assistants. The medical inspection of schools is conducted by eight Sub-Assistant Surgeons whose work is supervised by two Assistant Surgeons. The Health Educational Officer and his Assistant look after Health Propaganda and Publicity. The Sanitary Circles and the new Taluk Health Organisations are in the charge of ten Sanitary Circle Officers and two Sub-Assistant Surgeons. A large staff of Sanitary Inspectors, Vaccinators and Conservancy Overseers is working in the various Sanitary Circles.

Public Health Law.—The present Public Health Law of the State lies distributed in a few Regulations. The first Regulation of Public Health to be promulgated was the Epidemic Diseases Regulation II of 1073. Rules and Standing Orders have been framed under this Regulation from time to time regarding the control of epidemic diseases, such as plague, small-pox, cholera and typhoid fever. The Travancore Registration of Births and Deaths Regulation VII of 1096 M. E. (for rural tracts) may also be mentioned in this connection. The Municipal Regulation

V of 1095 M.E. embodies the necessary rules to guide the Public Health work in the several municipalities of the State. A set of Rules passed under date the 17th May 1893 regulate the procedure to be adopted by the medical officers, magistrates and the police in regard to the transmission of substances for examination to the Chemical Examiner. The Food Adulteration Regulation IV of 1106 M. E. and the Rules framed thereunder provide for the analysis of articles of food suspected to be adulterated and the issue of certificates in respect of them. A consolidated and all-comprehensive Public Health Law for Travancore is under consideration.

Programme of activities.—The programme of activities undertaken by the Public Health Department covers the following:—

- (1) Registration of vital statistics,
- (2) Control of communicable diseases:—
 - (i) Small-pox, (ii) cholera, (iii) malaria, (iv) typhoid fever,
- (3) Vaccination,
- (4) Plague control measures,
- (5) Medical Entomology,
- (6) Hookworm Survey and Treatment campaign,
- (7) Public Health Laboratory,
- (8) Health Unit, Neyyattinkara,
- (9) Rural sanitation,
- (10) Inspection of Municipal Public Health work,
- (11) School medical inspection, and
- (12) Public Health Education.

Registration of vital statistics.— It has been aptly described that vital statistics represent “the Book-keeping of Life”. Till 1069 M. E. (1893-94) there was no regular agency for the registration of vital statistics in Travancore, though the village officers were expected to keep a register of births and deaths known as “*Jananamarāṇa-kkaṇakku*”, which was neither accurate nor exhaustive.

With the passing of the Towns Improvement and Conservancy Regulation II of 1069 M. E., the registration of births and deaths was regularly started in the towns of Trivandrum, Nāgercōil, Quilon, Alleppey and Kōṭṭayam under the control of the Town Improvement Committees appointed by the Government in pursuance of the above Regulation. A scheme for the registration of births and deaths throughout the State was sanctioned with effect from the beginning of 1071 M. E. (August 1895), entrusting the compilation to the Sanitary Department newly organised in that year. The work was detailed in the scheme as follows:—

“The registration of vital statistics will be conducted in the Proverthy Cutchery by a Proverthi Accountant specially charged with the work. The necessary information will be furnished to him daily by a Virūthikkāran specially deputed for the purpose for each pakuthy. In the taluks of Thōvāḷa and Agasthīswaram the Village Watchman will collect and furnish the information, and in Shēnkōṭṭa the registering Accountants themselves will obtain the same direct. Special arrangements have also been made for the collection and recordation of statistics in the several Eḍavagaḷs and also in the hilly tracts, jails and lock-ups”.

With regard to the Town Improvement Committees, statistics were collected by the establishments under them and transmitted to the Sanitary Commissioner. In respect of the hill tracts, arrangements were made with the Conservator of Forests, the Superintendent and Magistrate of the Cardamom Hills (the designation of this office was changed later as Dēvikūḷam Commissioner) and the various Planters' Associations to have the statistics collected and sent to the Sanitary Commissioner. Information from the jails and hospitals were furnished by the officers in charge of those institutions. Regulation II of 1069 M. E. was repealed by Regulation III of 1076 M. E. but the provisions

relating to the registration of vital statistics were left untouched. There were no changes since then with regard to the system of collecting the statistics, except that the remuneration of the *Viṛuṭhikkār* by assignments of land was subsequently abolished and a stipendiary system substituted therefor.

Regarding the difficulties experienced in the collection of vital statistics, the Sanitary Commissioner in his first annual report to the Government wrote as follows:—

“We have neither the Village System of house distribution for rural areas, nor compulsory notification (of births and deaths) for urban areas. Here, as in the rest of Malabar, each house stands in a more or less extensive compound of its own and except in the taluks of *Thōvāḷa* and *Agasthīswaram*, which border on British territory and resemble it in its physical features and general aspect, we have an almost unbroken chain of houses extending from one end of the country to another. This makes the work of the collector of vital statistics exceedingly trying. Here, unlike the east coast, there is no uninhabited area that the collector of vital statistics may leave out of his programme of itineration. The whole extent of land has to be traversed. He has to walk several miles before he can possibly visit as many houses as are compactly included within an ordinary east coast village.”

The work suffered very much for several years for want of a legal authority enforcing the registration of vital statistics, till the difficulty was remedied by the Municipal Regulation V of 1095 M. E. and the Travancore Registration of Births and Deaths Regulation VII of 1096 M. E. (for rural tracts).

Registration Agencies.—The registration is at present conducted by the municipal staff in municipal areas, Conservancy Overseers in police conservancy towns, *Proverṭhikkārs* in *pakuthies* not included in municipalities or police conservancy stations, Revenue Inspectors in *Pirmēde* and

Dēvikulām taluks, Foresters in forest areas, and Medical Officers and Superintendents in the estates of the High Ranges. The consolidated vital statistics of the State are compiled at the office of the Director of Public Health from the quarterly returns received from the revenue and municipal authorities.

Experimental vital statistical schemes:—The collection of correct vital and morbidity statistics is a most important Public Health function. The Revenue Department had been attending to this work only as an incidental activity of their regular duties. The data obtained by them differed so greatly from known figures elsewhere that the former were found inadequate for statistical analysis. An experimental scheme was therefore tried whereby a Medical Officer of Health was deputed to foreign countries to make a special study of Vital Statistics and Epidemiology, and, on his return, Viḷavancōde taluk was selected for temporary experimental work in this direction. This work was carried on from Mēḍam 1106 M. E. till the end of 1108 M. E., when it was closed down. The scheme had for its objective the correct registration of vital and morbidity statistics as a means for eventually evolving an economic and efficient system of registration applicable for the whole State. The staff detailed for this work consisted of a Sub-Assistant Surgeon and six Sanitary Inspectors. The Sanitary Inspectors made exhaustive enquires about births, deaths, infantile deaths and causes of sickness in the respective pakuthies assigned to them, comparing their figures with those of the Revenue agency. The results disclosed large omissions in the figures collected by the Revenue staff. In 1106 M. E., for instance, while the Epidemiological staff recorded for Viḷavancōde taluk 5,131 birth and 2,286 deaths, the corresponding figures obtained by the Revenue staff were only 1,914 and 1,188, the respective omissions being 63 per cent. and 48 per cent. A similar system was put into operation in the Neyyāttinkara Health

Unit also, the Sanitary Inspectors of the Health Unit conducting the work of collection of statistics. It was found that as against 1,477 births and 616 deaths recorded in the Neyyāttinkaṛa Health Unit area by the Sanitary Inspectors of the Unit in 1106 M. E., the Revenue staff were able to register only 600 births and 309 deaths, the respective omissions being 59 per cent. and 50 per cent.

Both in the Viḷavancōde taluk and in the Neyyāttinkaṛa Health Unit another experiment was tried whereby the collection of vital statistics was entrusted in certain select areas to private agents on a nominal remuneration. The results did not compare favourably with the data obtained by the Sanitary staff.

Under the new Taluk Health Organisation Scheme introduced in the taluks of Thōvāḷa, Agasthiśwaram, Kalkulam, Viḷavancōde and Shenkōṭṭa from Vriśchikam 1112 M. E., an effective system of vital statistical registration has been put into operation in these select taluks. An important duty assigned to the staff posted in these taluks is to make house visits, gather correct information regarding births, deaths and communicable diseases, and compare their figures with those obtained by the Proverthikārs. This scheme of work has helped very much to ensure completeness in the registration of births and deaths in the rural areas of the five taluks referred to. The following table shows that omissions in the registration of births and deaths were a common feature in respect of the taluks in 1112 M. E:—

Taluk.	Births (1112 M. E.)			Deaths (1112 M. E.)		
	Total number recorded.	Number detected by Public Health staff.	Per cent. detected.	Total number recorded.	Number detected by Public Health staff.	Per cent. detected.
Thōvāla.	1,004	286	28·4	467	90	19·1
Agasthīswaram	3,546	737	20·8	1,481	218	14·7
Kalkulam.	6,094	3,082	50·5	2,284	990	43·3
Vilāvancōdo.	4,097	1,780	43·4	1,595	546	34·2
Shenkōtta.	1,511	128	8·4	990	58	5·8
Total.	16,252	6,013	37·0	6,817	1,902	27·9

In these five taluks alone, 6,013 births (37 per cent.) and 1,902 deaths (28 per cent.) were detected to have escaped registration by the Revenue staff. It may be stated here that, on the whole, the number of omissions in the entire State may be ranging from 40 to 50 per cent. in the case of births and 30 to 40 per cent. in the case of deaths.

Birth rate—The standard average birth-rate for the State has been estimated to be about 40 per mille of the population. The recorded figures, however, fall short of the estimated standard owing to defective registration, the recorded rate for 1112 M.E. being 24·88 per mille. Among the three major administrative divisions, Kōttayam division heads the list with a rate of 26·62 for 1112 M. E. As regards the major religions, the highest birth-rate (26·12 for 1112 M. E.) is in respect of the Christian community. Considering the various registration areas, it is seen that the highest rate recorded is for the police conservancy towns (38·24 for 1112 M. E.), the rates for the municipal towns and for taluks excluding all towns being lower, viz., 35·58 and 23·48 respectively for 1112 M. E. The nearest approach to accuracy

is attained by the conservancy towns which, however, hold only about $3\frac{1}{2}$ per cent. of the total population. Male births exceed female births, the ratio for 1112 M. E. being 106:78 for the whole State. The average decennial birth-rate from 1102 M. E. to 1111 M. E. is 22.55.

Death-rate.—The standard estimated death-rate for the State may be said to vary from 18 to 20 per mille of the population. The recorded rate in 1112 M. E. was 10.40 for the State. Classified according to the major religions, the highest death-rate appertains to the Hindu community, the rate for 1112 M. E. being 10.96. The police conservancy towns show the highest death-rate (18.72 for 1112 M. E.) owing to better registration, the municipal towns having a rate of 16.60, and the taluks excluding towns having 9.56 in 1112 M. E. The average decennial death-rate for 1102-1111 M. E. is 11.38. The death-rate in Travancore is very much lower than that in British India. The factors which contribute to this lower death-rate are the cleaner habits of the general populace and the scattered distribution of homesteads, which is a feature peculiar to Kēraḷa.

Infantile Mortality.—The standard average infantile mortality rate for Travancore may be taken to vary from 80 to 100 per 1,000 live-births. This figure is also very low compared to the British Indian rate. The recorded rate for 1112 M. E. was 73.0 for the State, the highest figure among the major administrative divisions being 80.7 in the Trivandrum division. It was 103.7 in police conservancy towns, 66.7 in municipal towns and 72.0 in taluks excluding towns, for 1112 M.E. The decennial average for 1102 M.E. to 1111 M.E. was 85.1.

In “the natural increase of population”, Travancore is highly progressive, the present annual rate of increase is seen to be about 22 per mille.

Small-pox and cholera are the common epidemic diseases that frequently break out in the state, plague being

a third scourge occurring now and then in certain parts of the State exposed to chances of infection from elsewhere. Malaria which is mainly endemic in the foot-hills shows, at times, a tendency to flare up under economic and meteorological conditions favourable thereto. In times of epidemics, the Public Health Department employs its armamentarium as effectively as possible and mobilises in the field all its best resources with a view to stamping out the outbreaks with the utmost energy and expedition. Concurrently with the efforts put forth to combat the epidemics, extensive relief measures are also organised for the alleviation of distress in the affected areas.

Small-pox. Small-pox had been occurring from very early times. But the earliest reference to the outbreak of small-pox in Travancore is in the Report for 1046 M. E. (1871). The epidemic is stated therein to have begun in a severe form during that year, lasting for several months and causing a heavy mortality. The next outbreak was reported in 1050 M. E. (1874-75), which continued till 1052 M. E., when it raged severely at the capital among the famine-stricken immigrants from Tinnevely. In 1057 M. E. (1881-82) it broke out in an epidemic form in South Travancore and for the following five years it prevailed more or less throughout the country. The next severe outbreak was in 1067 M. E. (1891-92), when it spread as a virulent epidemic throughout the State including the capital which suffered very severely. It continued its ravages for the following two years, the Quilon division and the taluks of Parūr, Kunnaṭhunād and Changanāśśōry in the Kōṭṭayam division suffering most from the scourge. The total attacks registered in the two years were 1,868 and 1,827 with a mortality of 583 and 487 respectively. These figures represent only the number brought under medical treatment, a comparatively small proportion of the total attacks and deaths. It was in 1077 M. E. (1901-02) that the highest

mortality from small-pox ever recorded in Travancore, viz., 12,855, occurred. As a tail-end of this disastrous epidemic, small-pox levied a toll of 5,070 lives in the succeeding year. After a moderate incidence from 1079 M.E. till 1082 M.E., the epidemic curve rose up again from 1,265 and 1,414 deaths in 1083 M. E. and 1084 M. E. to 5,004 and 5,457 deaths during the years 1085 M. E. and 1086 M. E. respectively. 852 deaths were reported in 1105, mostly from Alleppey and Trivandrum. Another epidemic wave swept over the country during the years 1106-7 M. E. claiming altogether 3,418 victims. The phenomenal progress of vaccination in recent years has reduced small-pox to a nominal incidence in the State.

Cholera.—From evidence that is extant, it is found that Travancore was subjected to frequent visitations of cholera since 967 M. E. The Travancore Administration Report for the year 1030 M. E. (1854) contains the following reference to cholera under the head Public Health:—"There was prevalence of cholera in the State, but in the absence of an agency, a record of cases was not kept".

The Annual Reports of the Medical Department from the year 1042 M. E. onwards contain accounts, meagre though they are, of the sporadic and epidemic outbreaks of cholera in several parts of the State, particularly in South Travancore. Of the ravages of cholera in Travancore in 1045 M. E. (1869-70), Dewan Sir T. Mādhava Rao has recorded his discerning observations as follows:—

"It is not as often as in other parts of India that cholera attacks Travancore. After a considerable period of almost perfect immunity, the disease made its appearance in the year under review, having been introduced from the contiguous British Province of Tinnevely. It lingered longer than usual and made much havoc in the southern taluks where the scarcity was most felt, the water-supply was worst and least attention paid by the people to sanitary requirements."

The epidemic spread from the south along the main and diverging lines of communication to upwards of fifty miles north of Trivandrum, causing altogether 3,599 deaths during the years 1045-46 M. E. (1869-1871). The next outbreak was during the years 1051-52 M. E. (1875-1877), involving 2,653 deaths. In 1057 M. E. (1881-82), it broke out at Nāgercōil and Śuchīndram, having been imported from the Tinnevely district by visitors to the annual Car Festival at Śuchīndram; it spread to many parts of both North and South Travancore. In 1059-60 M. E. (1813-1885), it levied a frightful toll of 4,823 lives. There was another terrible epidemic in 1064 M. E. followed by 6,599 deaths. A slightly milder wave in 1066 M. E. (1890-91) carried away 3,869 lives. After an year's lull, a fresh outbreak that occurred in 1068-69 M. E. (1892-1894) claimed 4,331 deaths; the havoc wrought by this epidemic was greater in North Travancore. It was the frequent and almost annual recrudescence of these epidemics and the alarming proportions they generally assumed which, among other reasons, led the Government to organise a separate Sanitary Department in 1071 M. E. (1895) to combat the epidemics as effectively as possible.

But the prospects did not improve. In some years they became worse. During the years 1071-1073 M. E. (1895-1898), there were as many as 18,982 deaths from cholera. The year 1076 M. E. (1900-01) witnessed another serious epidemic costing 10,508 lives and affecting practically the whole State. The epidemic continued throughout 1077 and 1078 M. E. (1901-1903), carrying away more than 2,000 lives each year. In 1082 M. E. (1906-07) cholera caused a heavy mortality, viz., 10,171. The disease was continuing ever since as a constant menace with alternating manifestations of mildness and virulence for the following several years. In 1103-04 M. E. (1927-1929), another furious outbreak over-ran South Travancore and also the taluks of

Trivandrum, Chirayinkīl and Shenkōṭṭa, claiming altogether 10,727 victims, the attacks being double that number.

The cholera epidemic of 1103-04 M. E. had proved the need for a more efficient Public Health Organisation to grapple with and control such emergent situations as efficiently and speedily as possible. The combating of cholera was one of the most prominent objects kept in view in creating the newly modelled Public Health Department. The latest epidemic of cholera occurred in 1111 M. E. (1935-36), causing altogether 11,792 attacks and 6,056 deaths. The outbreak raged first in South Travancore and then spread to several parts of North and Central Travancore. The Public Health Department took prompt measures to bring the epidemic under quick control. The Public Health Laboratory supplied 7,07,878 c. cs. of Cholera Vaccine for carrying on a Mass Inoculation Campaign, as a result of which the epidemic subsided within a shorter period, causing only a much lower incidence than in the case of the previous epidemic of 1103-04 M. E.

Epidemiology of cholera.—Special investigations conducted into the epidemiology of cholera both in Travancore and elsewhere have revealed the operation of a law of periodicity in the occurrence of cholera epidemics. The disease is ordinarily said to “occur in long waves the crests of which are reached in 5 or 6 years.” Cholera has been evincing a kind of selective affinity towards South Travancore on account of such favourable epidemiological conditions as the scarcity of water-supply, the presence of beach villages following the fishing industry with its unregulated evils, the congested village system of house distribution and the general apathy, ignorance and unclean mode of living on the part of the lower classes of people. The disease is often introduced in South Travancore from the Tinnevely district, particularly on such occasions as the St. Xavier’s Festival at Kōṭṭār and the Car Festival at Śuchindram which attract large numbers of visitors from various parts of South India.

The routine measures adopted towards the prevention and control of cholera epidemics in South Travancore are the establishment of Cholera Observation Stations, provision of wells, chlorination of water-supplies, adoption of sanitary precautions during festivals and anti-cholera inoculation campaigns when the disease is apprehended. The new Taluk Health Organisation Scheme introduced in South Travancore and Shenkōtta from 1112 M. E. is mainly intended to ward off the occurrence of cholera in these areas and thence to other parts of the State.

Malaria.—The malaria epidemic in South Travancore in 1110-1111 M. E. (1935-36) was the first reported epidemic of malaria in the State on an extensive scale, one that affected a far larger population than any other epidemic disease of which records are available. The foot of the hills from Bhūthappāṇḍy to Thoḍupūḷa forms a hyper-endemic belt of malaria and has been recognised as centres of malarial infection for a long time. The malaria epidemic of 1935-36 was an extension of the disease in a virulent and epidemic form from this belt to the fertile valleys beyond, particularly to the areas between Arūmana and Pālōde in the south. The epidemic was most severe in certain paku-thies of Neyyāttinkara and Neḍumangād taluks.

The chief causes for this epidemic outbreak were :—

(i) the failure of the monsoon, causing the drying up of river-beds and the formation of sluggish pools where anopheline mosquitoes began breeding profusely,

(ii) the successive failure of crops for two years, resulting in widespread starvation, leaving the people easy victims to infection, and

(iii) the movements of people from hyper-endemic areas at the foot of the hills to the plains in search of food or labour. The infection thus introduced blazed forth like a conflagration among the ill-fed population in Neyyāttinkara and Neḍumangād taluks.

The Public Health Department started vigorous and extensive measures for its control. Treatment centres for distribution of quinine were started, there being twenty-two such centres in Neyyāttinkara taluk, four in Neḍumangād taluk and four in Viḷavancōde taluk. Medicines were taken to the houses of patients not able to attend these centres. The Government sanctioned sufficient funds for the supply of rice to the poor malaria patients in these three taluks. Relief committees were formed locally at Neyyāttinkara, Neḍumangād and Kulithurai for collection and distribution of rice and clothing to the malaria stricken people. These measures afforded considerable relief and there was great reduction in deaths from malaria. But with the failure of the following monsoon and the repeated attacks of fever among the half-starved patients, fresh areas became affected and numerous complications requiring careful hospital treatment and nursing began to develop as daily occurrences. Temporary malaria hospitals and dispensaries were therefore opened in the affected areas by the Medical Department, the Durbar Physician assuming charge of the malaria control operations, the Medical Officer of Health, Epidemiology and Vital Statistics attached to the Public Health Department being appointed as Special Malaria Officer for exercising immediate supervision and directing the work in the field.

In order to provide work for the malaria stricken people, the Public Works Department started the opening of a few new roads. Another type of relief, and one which was paid for entirely from the collections raised by the Malaria Relief Committee of the Travancore Medical Association, was the feeding of school children in the worst affected areas of Neyyāttinkara taluk. The average number of children fed per day was 5,405. These control measures brought about a rapid decline in the death-rate from malaria and were responsible for saving thousands of lives.*

* The Āyurvēdic Department also opened certain treatment centres and did good work.

The inspiring message which emanated on the subject from His Gracious Highness the Mahārāja under date the 8th September 1936 is extracted below:—

“.....During my recent visit to some of the malaria centres I was not only greatly touched by what I saw, but I have also ascertained the extent of the calamity and the magnitude of the task ahead. My Government will spare neither effort, nor money to grapple with the situation and to combat the epidemic as indeed they have already done.....”

A recrudescence of malaria having occurred in 1113 M. E., a few additional dispensaries were opened besides undertaking relief measures such as provision of mid-day meal for school children.

Typhoid fever.—Typhoid fever is of frequent occurrence all over the State in a sporadic and sometimes in an epidemic form. The Public Health Laboratory, Trivandrum, produces and supplies T. A. B. Vaccine for Prophylactic Inoculation against typhoid. The disease has now been declared “Notifiable” under the Epidemic Diseases Regulation. Free inoculation against typhoid has been made available in all government hospitals and dispensaries.

It was by a gradual process that vaccination, in the early days of its introduction, began to gain the confidence and support of the people. That a commendable example in this direction was set by the members of the ruling family is seen from the following Royal Message sent by the then Mahārāja on the occasion of the opening ceremony of the old Trivandrum Civil Hospital:—

“It will be the duty of the Superintendent of Vaccination to travel into the interior to supervise the several medical subordinates who are employed there and to spread the benefits of medical aid in general and of vaccination in particular.....I hope I am not too sanguine in expecting

to see before many years elapse, if not the total disappearance, the considerable diminution of the scourge of small-pox in this country. It has been repeatedly proved that this is a thoroughly preventible disease. I take this opportunity earnestly to impress this fact on the minds of all my...subjects and to urge them to seek for themselves, for their children, for their friends, and for their servants, the great protection of vaccination. They will see the strength of my conviction in the fact that there is no member of my own family that has not had this protection conferred at an early age."

A Royal Proclamation was issued on the 14th August 1878, which, while pointing out the advantages of vaccination as a protection against small-pox, also called upon the general population to submit to the operation, setting before them the example of the royal family. The Proclamation is quoted below *in extenso*.—

"1. Whereas We are informed that many do not avail themselves of the protection against virulent attacks of small-pox which successful vaccination affords, and, being anxious to mitigate the ravages of that disease as far as possible, We are pleased to direct that every public servant, of whatever grade, shall, as a necessary condition of the service, have himself vaccinated within three months from the date of this Proclamation if not vaccinated within the last 5 years, and that no person shall hereafter be entertained in the public service unless he produces a certificate of having been vaccinated within that period.

"2. All students in the public schools of this State, whether the Institutions are directly under Government management or receiving grants-in-aid, are also required to be vaccinated as a condition of remaining in the Institution, and no new pupil shall be admitted unless the master is satisfied that he or she has been thus protected. Managers of grant-in-aid schools are required to certify at foot of their applications for payment of grants that all the pupils in the school have fulfilled this condition.

"3. The rule applicable to public servants shall hold good also in respect of Vakeels practising under Sunnads in the courts.

"4. All patients admitted to the public hospitals or seeking relief therefrom, and all convicts lodged in the public jails, shall be submitted to vaccination, so also the indigent receiving relief from public charities.

"5. It shall be obligatory on all the above classes of persons to have the operation repeated once every five years so long as they continue in the State in which vaccination is made compulsory by this Proclamation.

"6. The Managers of the Institutions or the Heads of Departments to whose influence the above classes of persons are amenable are directed to give effect to the provisions of this Proclamation.

"7. We hereby desire all public servants, and especially those of the superior grades, to further Our wishes by persuading those within the sphere of their influence to submit to the operation.

"8. Should any public servant be found to set people against vaccination or otherwise conduct himself in a spirit opposed to the tenor of Our wishes as herein expressed, he will be liable to summary dismissal.

"9. And finally, We desire all Our subjects distinctly to understand that, firmly believing in the efficacy of the prophylactic, We have protected the members of Our own House-hold by recourse to vaccination and that it is a duty they owe to themselves and those with whom they come in contact in the daily relations of life, to stamp out of the country that fell disease, the small-pox; a result which We can only hope to obtain when every individual, whether male or female, old or young, has been brought under the protecting influence.

"10. In many countries, vaccination has been made compulsory on the public at large under penalties enforceable by the law, as a means of ensuring public safety; and if We

do not have recourse to such penal measures in Our territories, it is from a reluctance to use the machinery of the law when, as We feel assured, there will be a voluntary submission to the operation, on Our wishes for the good of Our people being made known to them in this manner."

The British Resident also, when on circuit, used to have a certain number of recently vaccinated children brought to him at each village for inspection.

Prior to the formation of the Sanitary Department, the general control and supervision over vaccination rested with the Durbar Physician, the Superintendent of the Vaccination Department (started in 1041 M. E.) being the officer in immediate charge of it.

The arm-to-arm vaccination was in vogue in the earlier stages for several years. It was only in 1064 M. E. (1888-89) that the use of calf-lymph was first introduced in Travancore and sanction accorded for the maintenance of a Vaccine Depot at the capital. Hitherto the quality of the lymph used to be improved by the occasional introduction of animal lymph obtained from Madras. It was observed as follows in the Administration Report for 1064 M. E. :—

"Apart from the success attending the scheme, it is calculated to exercise a wholesome influence on the minds of the public, first removing the impression that the vaccine virus inoculated from hand to hand had the effect of producing diseases from which the subject may be suffering and secondly as the means of counteracting the prejudices of the higher classes in subjecting themselves to be vaccinated with the virus obtained from the lower classes of people. Such impression operated prejudicially to the progress of vaccination."

Vaccine Depot :— A Vaccine Depot was permanently constructed in 1066 M. E. (1890-91). As arm to arm vaccination was found to be unsuited from a sentimental as well as a scientific point of view, steps were taken to abolish it in 1071 M. E. (1895) and increase the manufacture and extend

the use of glycerine paste. But it was not until three or four years later that the crude method was completely abolished throughout the country. Sanction was also accorded for an increased number of calves for inoculation and a trained Superintendent was appointed to direct the propagation of animal lymph in the Vaccine Depot. A temporary Sub-Depot was also established at Suchindram, but this was closed in 1073 M. E. (1897-98) and arrangements were made for the manufacture of the requisite quantity of glycerine paste at the Central Depot at Trivandrum.

At first vaccine was prepared by hand in a mortar and the vaccine sent between glass plates and Saigon Tubes closed with corks, but in 1079 M.E. arrangements were made for preparing and filling glass tubes and hermetically sealing them by machines. When the Vaccination Committee appointed in 1088 M. E. examined the Depot, they were much pleased with the work turned out by the institution. The Vaccine Depot functioned as a separate laboratory with a fairly large staff, under a responsible officer next in rank to the Sanitary Commissioner, from 1071 M. E. till the reorganisation of the Public Health Department in 1109 M. E.

The change in the technique of vaccine production introduced soon after the reorganisation of the laboratory has raised both the quality and quantity of vaccine produced to a level which compares very favourably with that of some of the foremost laboratories of the world. High standards and tests are observed in the selection of the best and most healthy cow calves, subjecting them to a preliminary process of quarantine. Inoculation and harvesting of vaccine is done with the utmost antiseptic precautions. Vaccine is now being stored in a Cold Cabinet at 15-20°F, a temperature at which it is found to remain potent for about two years, enabling an abundant reserve stock being kept in hand. Every batch of vaccine is tested bacteriologically before it is issued, the tests proving a high degree of purity. It is also tested again for potency both on calves

and on children. The vaccine is issued in sterile vials or capillaries, as required. About 5,00,000 grains of vaccine were issued on an average each year during 1110 M. E. to 1112 M.E. The cost of the vaccine which used to be one anna five pies per grain has now been reduced to one anna per grain with a concessional rate of ten pies per grain in case purchases of 1,000 grains or more in bulk. The small-pox vaccine needed for use in Cochin was purchased by the Public Health Department of that State from the Vaccine Depot during the years 1110-1112 M. E. Seed vaccine is now being manufactured by regular rabbit passage, while it used to be purchased from the King Institute of Preventive Medicine, Guindy, formerly.

Vaccination Campaign.—Vaccination in the State is domiciliary. The present arrangement for vaccination consists in the distribution of the Vaccination staff over a number of Vaccination Ranges into which the Sanitary Circles and the new Taluk Health Organisations of the State are grouped, the work in each Range being attended to as a routine and continuous measure by the Vaccinator concerned. But in order to carry on an intensive drive against small-pox, the plan of work has been modified and a regular State-wide Vaccination Campaign has been inaugurated since the middle of 1169 M. E. (1934). The *modus operandi* is to concentrate the Vaccination staff at a particular pakuthy and to conduct vaccination in each area of work as exhaustively as possible, thus finishing pakuthies after pakuthies and taluks after taluks simultaneously in all the Sanitary Circles. The Sanitary staff, working in municipalities and conservancy towns, also carry on intensive vaccination in their respective areas. Steps are specially taken for vaccination in schools and in areas stricken by small-pox. Both vaccination and re-vaccination have been made compulsory in rural areas; it remains compulsory in municipal towns under the Municipal Regulation. The total vaccinations performed during the

triennium 1110 M. E. to 1112 M. E. is 36,36,846, i. e., 71·37 vaccinations for every 100 persons in the State. As a result of this intensive vaccination campaign, the incidence of small-pox in the State has now fallen very low.

With the occurrence of Bubonic Plague in Bombay and elsewhere, the Travancore Durbar felt the need for the adoption of due precautionary measures for protecting this State from the danger. The Plague Rules were thereupon framed and passed under the Travancore Epidemic Diseases Regulation.

Plague has been imported into Travancore on many occasions after the Madura district was infected. It got imported into Dēvikūḷam division in 1095 M. E. from the adjoining British Indian villages, three out of the four imported cases proving fatal. A few Plague Observation Stations were opened then in the High Ranges to check the further spread of the disease. In 1098 M. E. another case of plague was imported from the Madura district. The first indigenous outbreak of plague was in Dēvikūḷam in 1103 M. E., when there were thirteen attacks and six deaths. Observation Stations were opened then in Dēvikūḷam and Kōṭṭayam divisions. In 1106 M. E. two deaths from plague occurred in Kumīḷi when the adjacent British Indian villages were badly affected. The next outbreak was in Bonami in 1107 M. E., when there were thirty five attacks and seventeen deaths.

In 1110 M. E. plague broke out in Maṭṭānchēri in Cochin with seven attacks and five deaths and later on a more severe outbreak occurred at Kunnamkūḷam (Cochin), causing forty four attacks and twenty deaths. This necessitated control measures at the Cochin frontier. A chain of Plague Observation Stations was opened at all the important stations in the Travancore frontiers adjoining Cochin, so as to exercise a vigilant watch on the situation and to protect the

State from the invasion of the disease. In Makarāṃ 1110, rat-falls occurred in Munambam near the Cochin frontier and two cases of human plague with one death were reported. The place was declared infected and necessary measures for preventing the spread of the disease were adopted. Munambam became free from plague by Māḍam 1110.

Plague outbreak at Alleppey :—Ever since the outbreak of plague in Cochin the danger of the importation of the disease into Alleppey was steadily increasing. On the 26th Eḍavam 1111, the Alleppey Municipality reported the occurrence of a case of human plague. A Special Plague Officer was immediately appointed to deal with the situation promptly and effectively. The Market Ward wherein the disease first broke out was declared plague-infected and was subjected to compulsory evacuation, the huts and houses in the centre of the infected area being burnt down. There were altogether twenty five attacks and twenty two deaths from plague in the Alleppey town and three attacks and three deaths in the rural areas immediately outside the town. As many as 52,376 inoculations were conducted. Plague camps were opened at all the exits of the town, where grain and other goods likely to harbour rats, passing out of the town limits, were unloaded and disinfected. An extensive rat-destruction campaign was launched forth all over Alleppey and the several municipal towns in North and Central Travancore. A rat-flea survey was also carried on at Alleppey. The Public Health and Municipal staffs by their strenuous work managed to bring the situation to a normal stage by the close of the year 1111 M. E.

A Special Plague Officer of the rank of an Assistant Surgeon was subsequently appointed at Alleppey, with a plague staff under him, to carry on routine plague-preventive measures in the town, such as rat-destruction, rat-flea survey, etc.

Plague outbreak in Maṭṭāṇchēri (Cochin) in 1113 M.E. :—Plague broke out again in Maṭṭāṇchēri (Cochin) early in

1113 M. E. The Medical Officer of Health, Epidemiology and Vital Statistics was appointed as Special Plague Officer for Kōṭṭayam division. A good number of Plague Observation Stations were opened at the gateways of grain traffic from Cochin into Travancore, where it was examined whether the consignments were supported by disinfection certificates from Cochin, in the absence of which the materials were passed only after disinfection.

Plague Observation Work in Dēvikulam division :—The several Plague Observation Stations established at the “Meṭṭas” or passes from the adjoining British Indian villages to the High Ranges were working under the administrative control of the Dēvikulam Commissioner, who took the necessary technical advice from the Director of Public Health.

Experiments on Plague Research :—The Travancore Government have been offering an adequate contribution to the Madras Government towards experiments on Plague Research (Cyanogas Fumigation) in Cumbum Valley, since 1109 M. E.

Rat-Flea Surveys.—In view of the outbreak of plague in Pirmāde taluk, a rat-flea survey was conducted under the supervision of the Medical Entomologist of the Public Health Department, from September 1932 till March 1933. The results of the survey showed that “in the Pirmāde high-lying area, the prevalence of the principal plague transmitting flea *Xenopsylla cheopis* is extensive and its incidence high. The *R. rattus cheopis* index is very high, much higher than the index necessary for effective plague transmission as observed in other localities in India. Conditions are apparently favourable for enzootic plague in the elevated area of Pirmāde. It is difficult to decide whether *X. cheopis* is indigenous or has been introduced from infected areas to the east of the Ghats. In the lower region of Pirmāde on the west, *X. cheopis* is conspicuous by its absence and it is possible that this is due to climatic conditions adverse to

the life of *X. cheopis*. It does not seem likely that this absence of *X. cheopis* is due to any lack of facilities for transport of the flea with grain and merchandise."

A rat-flea survey was conducted in several towns from the close of 1111 M. E. in order to investigate the comparative epidemiological role played by the different species of fleas in plague transmission in various parts of the State. The areas surveyed according to this plan are the municipal towns of Alleppey, Changanāssēry, Kōṭṭayam, Quilon and Trivandrum, as also the conservancy town of Ēttumānūr. The results of the survey have disclosed a sprinkling of *X. cheopis* in all these areas, *X. astia* being the preponderant species.

The Medical Entomology Section of the Public Health Department was formed from the 14th October 1931, the services of the Medical Entomologist of the Medical Entomology. Calcutta School of Tropical Medicine having been borrowed for the purpose for a period of three years by the Travancore Government. A laboratory was equipped and the necessary staff also recruited. He submitted a general plan for the institution of a State-wide Malaria and Filariasis Survey and initiated work accordingly. On the reversion of the Medical Entomologist to his substantive post under the Bengal Government, two Entomological Circles, northern and southern, were formed for purposes of surveys and other field investigations, each being placed in the charge of an Assistant Surgeon subject to the general control of the departmental head. The supervision of the laboratory section was assigned to the Superintendent, Public Health Laboratory.

Malaria Survey.—Based on the survey of eighteen taluks, conducted under his directions, the Medical Entomologist has recorded the following principal findings:—

1. *Moderately Endemic Areas, i. e., with Spleen Rate of over 10 per cent*.—Kaṛikōde and Kaṛimaṇṇūr pakhthies in

Thoḍupūla taluk; Maṇṇūrkaṛa, Āryanād and Pālōde in Neḍumangād taluk; Aṛumana in Viḷavancōde taluk; Aṛumānallār in Thōvāḷa taluk; and Nēriamangalam in Mūvāttupūla taluk.

2. *Highly Endemic Areas, i e., over 25 to 50 per cent.*

Spleen Rate.—Rānni pakuthy in Paṭhanamthiṭṭa taluk; Mēkkaṛa and Puliyara in Shenkōṭṭa taluk; Kunnathukāl, Ottaśśēkhaṛamangalam and Peṛumkaḍaviḷa in Neyyāttinkaṛa taluk; Kaḷiēl in Viḷavancōde taluk; Thrippaṛappu pakuthy and estates in Kalkuḷam taluk; Kumiḷi in Pirmōde taluk; and Anchanād in Dēvikūḷam taluk.

3. *Hyper-Endemic Areas, i e., with Spleen Rate of over 50 per cent.*—Forest areas in Paṭhanāpuram and Neḍumangād taluks; Kovillūr and forest areas in Neyyāttinkaṛa taluk; Kārōde and forest areas in Viḷavancōde taluk; Ponmana and forest areas in Kalkuḷam taluk; forest areas in Thōvāḷa taluk; and Thēkkaḍi in Pirmōde taluk.

The most important of these malarial belts from the point of view of Public Health is the belt from Thōvāḷa to Pālōde, as it is a hyper-endemic belt lying near an area of congested population with whom they have easy communications. It is this belt that recently started the epidemic of malaria that flared up in Neyyāttinkaṛa and Neḍumangād taluks.

Varieties of malaria in Travancore.—All the three well-known types, viz., *P. vivax*, *P. malariae*, and *P. falciparum*, are met with. Their distribution in some of the important taluks is as follows:—

<i>Taluk.</i>	<i>P.vivax.</i>	<i>P.falciparum.</i>	<i>P.malariae</i>
Thoḍupūla ...	77·7 %	20 %	4·5 %
Paṭhanamthiṭṭa ∴	58·8 „	35·3 „	5·9 „
Shenkōṭṭa ...	68 „	38 „	2 „
Neḍumangād ...	55 „	13·4 „	46·3 „
Neyyāttinkaṛa ...	52 „	19 „	33 „
Viḷavancōde ...	47·4 „	5·3 „	47·4 „
Kalkuḷam ...	39·5 „	18·6 „	46·5 „
Thōvāḷa ...	4·3 „	20 „	51 „

The surveys not having been done simultaneously in all the taluks, allowance must be made for the seasonal variations of the different types. The fact, however, stands out clear that Quartan infections are very common in South Travancore and *P. vivax* in the north. High Quartan infections are associated with endemic malaria of long standing. The hospital figures also show that malaria in South Travancore is endemic and the incidence of sickness during the malaria season and the off season is not so widely different as in Thoḍupula taluk where malaria bears more the complexion of an epidemic outbreak. In the Neyyāttinkara epidemic, roughly 40 per cent. of the cases were "Malignant Tertian" and a little over this was "Benign Tertian," while "Quartan" infections were found to be between 10 and 20 per cent. The intensity of infection in epidemic malaria was very great and complications, such as kidney disease, intense anaemia, dysentery-like symptoms, etc., were very common, especially after a few relapses.

Mosquito Vectors of malaria in Travancore:—The Anophele mosquitoes that are recognised as carriers of malaria are *A. culicifacies*, *A. fluviatilis*, *A. varuna*, *A. jeythoricensis*, *A. hyrcanus*, *A. maculatus*, and *A. philippinensis*. Infections under natural conditions were found in *A. culicifacies*, *A. varuna* and *A. fluviatilis*, and in one case *A. jeythoricensis*. The first three are the mosquitoes met with in the epidemic area also. Small streams, rivers, unused wells and ponds are the common breeding places, and in the recent epidemic, the entire river-bed of Neyyār and its tributary streams were found to be breeding *A. culicifacies*.

The places surveyed subsequently were the taluks of Kōttayam, Changanāssery, Thiruvalla, Dēvikuḷam, Mīnachil and Muvāttupula. Special malaria investigations were also conducted in Trivandrum and Neyyāttinkara towns, Kumili (Pirmēde taluk), Eḍakkōde (Viḷavancōde taluk), Paḷlivāsal Power-House Colony and at Athirappally.

The areas with filarial disease, as disclosed by the survey, are the following taluks:—Shēṛṭhala, Ampalapuḷa, Kārṭhigappally, Kaṛunāgappally, Kalkuḷam, Vaikom, Parūr, Kunnāṭhunād, Neḍumangād, Paṭhanāpuṛam, Kōṭṭāṛakaṛa, and Viḷavancōde, and the towns of Trivandrum, Alleppey, Quilon, Parūr, and Iṛaṇiel. Endemic filarial disease is observed in (1) the taluks of Shēṛṭhala, Ampalapuḷa, Kārṭhigappally, and Kaṛunāgappally, (2) portions of the taluks of Kalkuḷam, Vaikom, Parūr, Kunnāṭhunād, Neḍumangād, Paṭhanāpuṛam, Kōṭṭāṛakaṛa, and Viḷavancōde, and (3) towns like Trivandrum, Alleppey, Quilon, Parūr, Iṛaṇiel, Punalūr and Kōṭṭāṛakaṛa. It is possible that filarial disease may occur in other parts of the State still unsurveyed.

In the coastal tracts from Shēṛṭhala to Kaṛunāgappally filariasis is fairly common, but the incidence of the disease decreases markedly as one proceeds southwards from Shēṛṭhala. Among towns, Trivandrum, Alleppey and Iṛaṇiel are badly affected. All the different types of filaria, affection are observed in the State, Elephantiasis of the leg being observed to be the most common affection.

Filarial Infection:—Two types of filarial infections occur in Travancore, viz., *Filaria (Wuchereria) bancrofti* and *F. malayi*. Till the survey was started in Travancore, it was not at all known that *F. malayi* infection occurred in this State. The former belief was that the only infection occurring was that of *Filaria bancrofti* and that the cause for the incidence of the infection was the prevalence of *Culex fatigans*, the known transmitter of *F. bancrofti* infection. The importance of this finding lies in the fact that the control measures applicable to *C. fatigans* are ineffective against *F. malayi*. The distribution of the two infections in Travancore differs markedly. The distribution of *F. malayi* is typically rural and that of *F. bancrofti* urban. *F. malayi* infection occurs in the coastal tract from Shēṛṭhala to Kaṛunāgappally and in the western portions of

Parūr, Kunnathunād and Vaikom taluks. It is also observed in Irāṇiel, Alleppey, Punalūr, Koṭṭāṛakara, and Shenkōṭṭa towns, in the Kāṇi settlements in Paṭhanāpuram, Koṭṭāṛakara and Neḍumangād taluks and in Kaḍayal village in Viḷavancode taluk. The areas with heavy incidence of *F. malayi* infection are the taluks of Shēṛṭhala, Ampalapula, and Kārthigappall̥y, the western belt of Vaikom taluk and Eḍappall̥y paktūṭhy in Parūr taluk. The type of Elephantiasis observed in *F. malayi* areas is solely the affection of the legs and hands. This is in marked contrast to *F. bancrofti* areas where Hydrocele and Elephantiasis of the scrotum are nearly as common as affections of the legs and hands.

Vectors of F. Malayi and their Bionomics:—The transmission of *F. malayi* infection is through the agency of the three species of *Mansonioides* that occur in Travancore, viz., *M. annulifera*, *M. uniformis* and *M. Indiana*. Of these, the most important transmitter is *M. annulifera* which is by far the most common of the three species, and next to this species in point of importance is *M. uniformis*. *M. indiana* is comparatively rare in the State and does not appear to be of any great importance as a transmitter of the infection.

The life-history of the *Mansonioides* mosquitoes, the principal transmitters of the infection, has been studied in detail. The mosquito lays eggs on the leaves of the floating water-plant *Pistia*, unlike other mosquitoes which oviposit on water. This habit has been observed in all the three species of *Mansonioides*. The larvae attach themselves to the roots of *Pistia* by their tail-siphon and obtain the oxygen for their breathing from the air-cavities in the root. The larvae develop into pupae, which also obtain their oxygen from the air-cavities of the roots. The pupae, when mature, come up to the water surface and the adult emerges. Two factors are observed to be indispensable for the development of *Mansonioides*, viz., (1) the presence of the water-plant *Pistia*, and (2) the presence of suspended organic matter in

the water. Either of these by itself would not suffice. Organic contamination is necessary for the food of the larvae and the *Pistia* plant is essential for the oviposition and for the development of the larvae and the pupae. The amount of organic matter required could be furnished either by decaying vegetable matter or by decaying animal matter. Rotting of coconut husk in the water, steeping cadjans, contamination with human or animal excreta, or inflow of sullage into the water could produce the requisite food for the larvae.

The incidence of *F. malayi* infection is directly related to the intensity of the incidence of *Mansonioides*. The incidence of *Mansonioides* mosquitoes is dependent on the following determining factors:—

- (1) Presence of a large number of ponds,
- (2) presence of *Pistia* plants in the ponds, and
- (3) presence of organic contamination in the water to the optimum extent.

Where these factors exist to a high degree, *F. malayi* infection is very common. Where they are less, the incidence of the infection tends to diminish. The control measure indicated against *F. malayi* infection is *Pistia* clearance.

F. Bancrofti Infection:—The areas where this infection has been observed are the towns of Trivandrum, Alleppey, Quilon, Irāñēl and Bhūthappāñdy. Some stray cases of *F. bancrofti* infection are observed in Parūr, Ampalapūla, Kārthigappally, Vaikom and Kalkuḷam taluks. The distribution of *F. bancrofti* infection is typically urban in character and it is more common in densely crowded towns than in the less densely populated ones. The factor that conduces to endemic *F. bancrofti* infection is the stagnation of sullage-diluted sewage and presence of ponds with organic contamination, which facilitate heavy breeding of *Culex fatigans*, the primary transmitter of *F. bancrofti* infection. This mosquito breeds profusely in sullage. Towns with imperfect

drainage systems are more heavily infected than those in which the drainage system is perfect or those that have no drainage system at all. The primary factor that determines the incidence of *F. bancrofti* infection in a locality is the prevalence of *Culex fatigans* in fair number. Measures for the prevention of *F. bancrofti* infection and for the control of Filariasis in *F. bancrofti* areas are the following:—

(1) Prevention of *Culex fatigans* breeding by reclamation of small ponds, ditches, manure pits and cess pits,

(2) prevention of execution of drainage systems that are not complete and in which there is no provision for the final disposal of the sullage in a manner that would not allow mosquito breeding, and

(3) treatment of all *C. fatigans* breeding places with larvicides for the destruction of mosquito larvae and pupae.

Filariasis Field Station at Paṭṭanakkād:— A field station for carrying out observations on the factors relating to the transmission of *F. malayi* infection has been at work in an intensely affected area of Shērṭhala taluk, viz., Paṭṭanakkād, from July 1932. The following important studies are undertaken at the station:—

(1) Susceptability of different species of mosquitoes to *F. malayi* infection under natural as well as experimental conditions,

(2) seasonal variations in the infectivity rates,

(3) seasonal incidence of different species of mosquitoes,

(4) seasonal incidence of *Mansonioides* breeding, and

(5) studies on the bionomics of *Mansonioides*.

The valuable findings regarding the breeding and the aquatic stages of the *Mansonioides* mosquitoes in association with the water plant *Pistia stratiotes* were arrived at as a result of the researches carried on in this station.

Malaria Field Stations:—After a preliminary survey of some malarial tracts in South Travancore, a Research Station for carrying out intensive studies on problems

connected with malaria was started at Kulaśēkharam in Kalkulam taluk from August 1932. A small staff was stationed at this place to carry out observations in four villages, viz., Kaliel, Thripparappu, Thirunanthikkaṛa and Kākkachāl, which were selected because of their high incidence of malaria. Occasionally observations are also made in a few other localities in the vicinity.

The programme of research work chalked out for the Station comprises the following:—

- (1) Seasonal incidence of *Anopheles* breeding,
- (2) seasonal incidence of adult *Anopheles*,
- (3) infectivity of different species of *Anopheles* under natural conditions,
- (4) seasonal incidence of malarial sickness,
- (5) seasonal variations in the degree of splenic enlargement among children,
- (6) incidence of the three types of malarial infection as observed from blood films taken from fever cases, and
- (7) record of meteorological conditions.

As many as twenty species of *Anopheles* have been recorded from the area under observation at Kulaśēkharam. The four important malaria transmitting species in the area are:—*A. jeyporiensis* var *candidiensis*, *A. fluviatilis*, *A. culicifacies* and *A. varuna*. The season of high malarial incidence lasts from April to June, the period of the highest spleen rate being identical. *P. vivax* is the commonest infection observed in the village, *P. malariae* ranking next in frequency.

A second Malaria Field Station similar to that at Kulaśēkharam was opened at *Perumkaḍaviḷa*, one of the worst malarial centres in Neyyāttīnkaṛa taluk, from 1111 M. E. After a preliminary survey, the villages of Māmpalakkaṛa, Perumkaḍaviḷa, Ottaśēkharamangalam and Chempūr were chosen for intensive study. The study of larval incidence, the study of the prevalence and infectivity of the adult

mosquitoes, and spleen and parasite study formed the chief subjects of investigation. The results obtained tend to incriminate *A. fluviatilis* as a definite carrier of malaria in this centre.

From the investigations conducted in the Malaria Field Station opened at Perumpaluthur in 1113 M. E., it is seen that *A. fluviatilis* is the main vector of malaria in the locality.

Mosquito Control Operations.

Trivandrum Municipal Town.—Following a preliminary Filariasis Survey conducted in the Trivandrum town, an anti-mosquito scheme with a view to control filarial infection was started in October 1932. From October 1932 to August 1933, funds for this scheme were provided from a grant made by the Rockefeller Foundation. From August 1933 to August 1934, the expenditure was met jointly by the Government and by the Municipality. By the close of the year 1108 M. E., the reduction in the incidence of all species of mosquitoes was as much as 85 to 95 per cent., and in some places even more. The work was handed over to the Municipality from 1110 M. E.

Iraniel.—The survey of Iraniel town showed that a very heavy incidence of filariasis occurred there. It was felt that the conditions prevailing in that town were such that immediate measures of control were necessary. Control work was accordingly started on the 1st October 1933, but it had to be closed down by August 1934.

Alleppey.—The survey carried out at Alleppey showed that the gross filarial infection rate and the endemicity rate of the town was very high. The incidence of mosquitoes capable of transmitting the infection was also high and the situation in regard to filariasis called for the early adoption of the requisite control measures. A mosquito control scheme drawn up accordingly was put

into operation from Makarāṃ 1110 M. E. at the Alleppey town, half the cost of the work being contributed by the local Municipality. The work has been in progress since then, the expenditure being jointly met by the Municipal Council and the Public Health Department. The operations include:—(1) Inspection of premises and destruction of temporary breeding places and oiling such temporary breeding places as could not be destroyed, (2) oiling permanent breeding places, and (3) Pistia clearance for *Mansonioides* control. The efficacy of these measures is periodically tested, the results being very encouraging.

Quilon.—The mosquito control operations at Quilon were started in Thulām 1112 M. E. the local Municipality contributing half the expenditure. The work commenced with a preliminary survey of the breeding places and was followed by extensive Pistia clearance and oiling operations. The average mosquito collection per hour which was 189 in Vrischikam 1112 M. E. at the commencement of the work, abated to such a low catch as six at the end of the year, testifying clearly to the success of the work.

Filariasis Control Work in Shērṭhala.:—The Filariasis Survey of Shērṭhala taluk disclosed a heavy incidence of *F. malayi* infection, the rates of filarial infection, disease and endemicity being 27·4 per cent., 23·0 per cent. and 46·6 per cent. respectively. In view of the finding *re*: the peculiar bionomics of the *Mansonioides* mosquitoes — the filarial vector in Shērṭhala — in association with the water-plant Pistia, a control scheme against the disease by the manual removal of Pistia from the numerous water collections was formulated and put into operation late in 1933 in an area of approximately fifteen square miles centering on Shērṭhala town. The area was extended by another fifteen square miles in 1936. The main work is the periodic clearance of Pistia from all water collections in the control area. Preliminary Pistia clearance was begun in November 1933, but it was not until July 1934 that the first well-organised

round of the area was started, succeeding in completing it only by April 1935. Thereafter fourteen rounds were made up to the middle of January 1937, the number of days per round and the estimated number of acres of *Pistia* cleared progressively diminishing very much with each round.

Mosquito collections are obtained monthly at eight stations, two of which are located in the middle of the control area at Shērthala and Thannīrmukkam, two midway between these central stations and the border of the control zone, two at the peripheral region and two beyond the area under control. The test catches of mosquitoes per hour, obtained from the stations within and outside the control area have shown the incidence of the *Mansonioides* mosquitoes to be heavy outside the area of control, and steadily decreasing from the border to the middle, resulting practically in total elimination at the centre of the control zone. The removal of the *Pistia* is intended to control only the actual culprit, viz., the *Mansonioides* species, and judging from the figures relating to the test catches, it is found to be an effective measure, since no specimens of these species were reported from the central catching stations after 1935; there is no appreciable change in the catches of other mosquitoes, which are not affected by the removal of the *Pistia*. A further test made in April 1937 disclosed that in seventy one children two years old and under, there were no infections in the controlled zone, while 19·6 per cent. of fifty six children in a near-by comparison area were found to have *Mf. malayi* in specimens of blood taken at night. The control of the *F. malayi* infection in children affords an excellent example of the suppression of a mosquito-borne disease by a strictly limited species control of the carrier.

This has already been discussed under "Plague Control Measures".

Hookworm Survey and Treatment:—A State-wide Hookworm Survey was conducted in 1930 whereby out of 27,791 examinations conducted, 92·0 per cent. of the cases proved

positive, the rate of intensity of infection being an average egg-count of 1,400 per c. c. In view of this high incidence of the disease, a Hookworm Treatment Campaign was conducted all over the State, the treatment being repeated in such taluks as showed higher infection rates. The Treatment Campaign lasted from 1106 to 1109 M. E. with an intervening period when it was held in abeyance. The work was carried on from taluk to taluk by an itinerant Medical staff which functioned in the form of several Treatment Units, dispensing the treatment at public centres, such as schools located in various pakhuties, and collecting the local people by previous notifications. Fæcal specimens used to be obtained both before and after treatment as a means of testing the efficacy of treatment. The use of sanitary latrines and avoidance of soil pollution were also concurrently advocated as the chief preventive measures against Hookworm infection. A separate course of treatment was given in the estates for the benefit of the cooly population. The total number of persons treated during the Campaign was 336,913.

The Public Health Laboratory was organised early in 1109 M. E. by the amalgamation of (1) The "Bacteriological
Public Health Laboratory. Laboratory" which was under the Medical
Department, (2) the "Vaccine Depot" of
the Sanitary Department, (3) the "Chemical Examiner's
Laboratory" which was working directly under the Government, and (4) the "Hookworm Laboratory" which had come into existence along with the new Public Health Department. To these were also added the newly created "Public Analyst's Section", the "Entomological Laboratory" and the "Research Section." All these various sections which were accommodated in different buildings have been housed together in the new Public Health Laboratory opened in 1113 M. E. during the Birthday Week of His Highness the Mahārāja,

Bacteriological Laboratory:—This was first organised temporarily as a separate unit of the General Hospital, under the Surgeon-in-charge, in 1089 M.E., and after a period of one year, was established as a permanent section thereof. This section was re-organised as a separate institution under the control of a Bacteriologist in 1096 M.E. With the reorganisation of the Public Health Laboratory in 1109 M. E. the Bacteriological Laboratory became the Bacteriological Section of the new Laboratory. This section undertakes diagnostic work, preparation of vaccines and other miscellaneous items. The diagnostic work consists of cultural examination of stools, blood, urine, pus and other exudates for the isolation of organisms responsible for the diseases investigated. The Diagnostic Service also includes Serological tests for the diagnosis of diseases, chiefly syphilis and enteric fever. For diagnosis of typhoid, Widal's Test is adopted. Specimens for the diagnosis of syphilis are subjected to both Kahn's and Hinton's Tests. The further items of diagnostic work comprise microscopical examinations of specimens, pathological examinations, bio-chemical tests and animal inoculations.

Vaccines:—The preparation of vaccines in the Laboratory includes both prophylactic and curative vaccines. The chief prophylactic vaccines prepared are for small-pox, typhoid and cholera. Small-pox vaccine has already been dealt with under Vaccination. After the reorganisation of the Laboratory, a steady increase in the outturn of T. A. B. Vaccine has been effected. All the hospitals and dispensaries are being supplied with this vaccine regularly, so that all contracts of typhoid fever may get free inoculation. The cost of the vaccine, for persons who can pay for it, has been reduced from eight annas to two annas per c. c. so as to encourage its wide use. The preparation of cholera vaccine was begun for the first time after the new Laboratory came into existence. During the last cholera epidemic in 1111 M. E., 7,07,878, c. c.s of this vaccine worth about Rs. 45,000 were produced and issued from the Laboratory, saving

thereby thousands of human beings from falling a prey to the epidemic. A stock of the vaccine sufficient for meeting any emergency is maintained in the Laboratory.

The Curative Vaccines produced from the Laboratory include auto-vaccines, simple or compound, and stock-vaccines. Auto-vaccines are rendered available for a variety of conditions, such as, boils, abscess, eczema, bronchitis, asthma, urethritis, cystitis, puerperal fever, etc. Vaccines prepared from bacteria obtained from different persons suffering from the same or allied conditions are pooled together as stock vaccines.

Miscellaneous Services:—The other miscellaneous items of work undertaken at the Laboratory are the bacteriological examination of vaccine lymph, milk, and water; preparation of oils, such as, Hydnocreol for injection in cases of leprosy; preparation of solutions of Percain and Novocain; and also supply of glassware, Media and other diagnostic outfits.

Research :—The Research Section is carrying on a useful study of Enteric Infection in the State.

Anti-rabic treatment:—There was formerly no centre for anti-rabic treatment in Travancore and hence all the patients had to go to Coonoor for the purpose. But in 1099 M. E. this treatment was started in the Bacteriological Laboratory, Trivandrum, after getting a Sub-Assistant Surgeon trained in the work in the Pasteur Institute, Coonoor. The vaccine is, however, got down from Coonoor itself. Indigent persons certified as such by the Tahsildars concerned are given their fare to and fro, admitted into the General Hospital and are treated there. Treatment is free to all. The normal course of anti-rabic treatment lasts two weeks. The number of persons treated for rabies from 1108 to 1112 M. E. is given below :—

Year.	No. of persons treated for rabies.
1108	890
1109	1,165
1110	1,435
1111	1,278
1112	1,739

Entomological Laboratory:—This section of the Laboratory undertakes the examination of blood films for malarial and filarial parasites and identification and dissection of entomological specimens which are received from the different field survey parties. Researches are also carried on regarding the entomological aspect of insect-borne diseases.

Chemical Examiner's Section:—This was started as an independent department in 1890 and was working directly under the orders of Government for forty three years till its absorption into the Public Health Laboratory in September 1933. Till then the post of the Chemical Examiner to Government was usually held by the Surgeon in charge of the General Hospital, Trivandrum. After its amalgamation with the Laboratory, the Superintendent of the Laboratory has become the Chemical Examiner to Government for purposes of Section 386 of the Criminal Procedure Code. The Chemical Examiner's Section furnishes reports upon any matter or thing duly submitted for examination or analysis in the course of any proceedings under the Criminal Procedure Code, which may be used as evidence in any criminal enquiry, trial or other proceedings. The main items of work are chemico-legal examinations of cases of human poisoning, cattle poisoning, blood-stains and seminal stains, and analysis of miscellaneous materials, such as, liquor, salts, soils, food-stuffs, etc.

Public Analyst's Section:—This section undertakes the analysis of the articles of food suspected to be adulterated and also to issue certificates as provided for in Regulation IV of 1106 M. E. and the Rules framed thereunder. A.

systematic analysis of the common foodstuffs of the country to find out their nutritive value as well as the standard applicable to local conditions is another work included within the purview of the Public Analyst's Section. At the request of the Pudukkōttah Durbar, the articles of food seized under their Food Adulteration Regulation are also being analysed by this branch of the Laboratory.

The Health Unit represents an intensive type of Rural Public Health Work which has been tried and found successful in many countries both in the west and in the east. It was decided to develop one Health Unit in a select area in Travancore as an experimental measure. A Medical Officer of Health was deputed in 1930 to foreign countries for training in this branch of work.

After visiting many places and considering all factors, it was decided to locate the Health Unit at Neyyāttinkara. The Unit began with an area of the twenty eight square miles and a population of 39,580, expanding subsequently to forty square miles and a population of 73,340. The controlling officer of the Unit is a Medical Officer of Health who from 1113 M. E. is also the District Health Officer, southern district. The Unit staff under him consists of one Assistant Surgeon, four Public Health Nurses, ten Midwives, and six Sanitary Inspectors, excluding the Sanitary Inspector and the two Midwives of the local Municipality. The Unit began work from Eḍavam 1106 M. E. (May 1931). The Poonamalle Health Unit in Madras and the Pratabgarh Health Unit in the United Provinces are much younger to the Neyyāttinkara Health Unit in this State, which was the first to inaugurate the system of Health Unit work in India.

To start with, a detailed house to house survey was carried out in order to collect correct statistical data in regard to the Public Health problems in this area. The Sanitary Inspectors undertake an exhaustive registration of

vital statistics. The data collected for the period 1107 M. E. to 1112 M. E. are given below, from which it may be seen that there is a distinct downward trend in the mortality rates:—

	1107.	1108.	1109.	1110.	1111.	1112.
Birth-rate.	41·09	42·04	42·7	38·06	29·00	38·23
Death-rate.	14·09	16·03	15·7	14·12	14·47	12·03
Infant morta-						
lity rate.	94·56	123·16	103·5	84·52	87·92	66·69

The control of communicable diseases is dealt with as an important activity. No pains were spared in combating, as effectively as possible, the malaria and cholera epidemics that occurred within the Unit area during the years 1110 M. E. and 1111 M. E. Anti-typhoid inoculation is also carried out in the Unit if any cases of typhoid break out. Intensive vaccination and re-vaccination are being pushed on vigorously. The Public Health Nurses conduct Home-Visiting and Maternity and Child Welfare Clinics. The Midwives register ante-natal cases and attend an appreciable percentage of confinements. The Assistant Surgeon carries on school medical inspection. Hospital Treatment for ordinary ailments and attention by the Dental, Ophthalmic and Ear-Nose-Throat Specialists, according as the cases would require, are arranged for the benefit of school children with physical defects. The main activities under Rural Sanitation include the installation of bored-hole latrines and the protection of public wells by providing Hand-Power Noria water-lifts. Health Education is also carried on. The Health Unit strives to establish an intimate contact with the masses and to make the villager participate in its various activities by the organisation of Health Leagues.

The Unit has also been functioning as a training centre for Public Health workers. Zealots in rural reconstruction schemes visit the Unit for studying modern Rural

Health Work as carried on therein. The various activities pursued in the Neyyāttinkara Health Unit have evoked comments of high appreciation from several distinguished workers including reputed Public Health authorities.

The average *per capita* expenditure in the Health Unit is nearly six annas.

Conservancy Stations :—The earliest measure to be taken in the direction of Rural Sanitation was the establishment of small Conservancies in 1064 M. E. (1888-89) in certain important stations such as Pārūr, Vaikom, Changanāssēry, Shenkōtta, Varkala and Padmanābhapuram. In 1065 M. E. (1889-90) some additional Conservancies were established at certain other places also, besides strengthening those started previously. In 1069 M.E. the number of the Conservancy establishments at the out-stations rose to thirty two and these continued to be maintained under the supervision of the taluk authorities.

The organisation of the Sanitary Department in 1071 M. E. was availed of for placing the Conservancy establishments on an improved footing. The Revenue officers were relieved of their Conservancy duties and all the Conservancy establishments were placed under the control of the Sanitary Department. The Conservancy staff was strengthened at all the stations, fresh establishments were provided at all places where none existed before, and Overseers were appointed at stations where the duties were looked after by the Revenue peons or pound-keepers. A reorganisation of the Conservancy establishment in the moffussil was sanctioned and given effect to in 1073 M. E., the number of the sweepers and peons was increased and the pay of the staff generally raised. In 1075 M.E. the street lights in some of the towns in the moffussil were transferred to the Sanitary Department and arrangements made for their lighting. There are now forty two major Conservancies inclusive of twenty nine Police Conservancy towns.

The Major Conservancies possess a staff consisting of an Overseer and some sweepers. In these stations vaccination, sweeping and other general sanitary services are available. In certain Conservancies lighting also is attended to. In Police Conservancy towns, registration of vital statistics too is undertaken. The total number of Minor Conservancies is twenty two. It is the particular Range Vaccinator, within whose Range the Minor Conservancy concerned falls, who supervises the sweeping work therein—the only activity in Minor Conservancies. In cases where this arrangement could not be adopted, the supervision is given over to a responsible local Citizen in an honorary capacity, subject to the control of the Sanitary Circle Officer in charge of the jurisdiction.

Market Sanitation.—The Sanitary Circle Officers make periodical inspections about the sanitation of the markets included in their respective Circles and take such further action as is considered necessary.

Sanitation of fairs and festivals.—Elaborate sanitary arrangements are made in connection with the important fairs and festivals in the State, as for instance, the Car Festival at Śuchīndram, the Maṇḍakkāḍ Festival, the Śabarīmala Festival, etc.

Rural Water-Supplies.—Cholera being chiefly a water-borne disease, the Sanitary Commissioner submitted to the Government recommendations for effecting some improvements with regard to the provision of water-supplies, and in 1907 secured the necessary sanction for setting apart Rs. 5,000 a year for the sinking and improvement of wells. Besides sinking a few new wells every year, existing wells are also being improved, repaired and cleaned. They are further chlorinated during times of outbreaks of water-borne diseases, such as typhoid and cholera.

Rural Latrine Construction.—A campaign is being launched upon for the installation of bored-hole latrines, wherever suitable, in rural areas.

Prior to 1052 M.E. (1876-77), very little attention used to be paid to the conservancy or sanitation of even the capital town beyond employing a few sweepers under the orders of the Tahsildar to occasionally sweep the streets within the Fort. The system was slightly improved in 1055 M. E. In 1056 M.E. (1880-81), a committee investigated the question and recommended a new programme of sanitation for the capital, which was put into operation. In 1067 M. E., following a severe outbreak of cholera and small-pox at the capital, the sanitary arrangements were improved still further.

Sanitary Committees:—Except for occasional small temporary establishments employed for the towns of Alleppey and Kōṭṭār, whenever epidemics broke out, there were no regular sanitary establishments for the moffussil towns. In 1062 M. E. (1886-87), the Conservancy system was extended to the towns of Kōṭṭayam, Alleppey, Quilon and Kōṭṭār (including Nāgercōil). Small monthly grants were sanctioned for each of these, the administration being entrusted to the local committees presided over by the Chief Magistrate of the place and assisted by two of the leading local citizens. This was the germ of the Town Improvement Committees that followed later.

Town Improvement Committees:—With the passing of Regulation II of 1069 M. E. (1893-94), a good beginning was made in the field of urban sanitation in some of the more important towns, such as, Trivandrum, Nāgercōil, Quilon, Alleppey and Kōṭṭayam. The Presidents of the Committees were made the Chief Executive Officers responsible to the Committees as well as to the Government. Another forward step was taken in 1076 M. E., when a regulation was passed to amend the Towns Conservancy and Improvement Regulation II of 1069 M. E., in view to meet the growing demands of sanitary administration. This enactment was modelled on the lines of the Municipality Acts of British India,

Municipal Councils.—Five towns, Trivandrum, Nāgercōil, Quilon, Alleppey and Kōṭṭayam, soon evolved into Municipalities. They now constitute the Major Municipalities of the State. The number of Municipalities rose to nineteen by the addition of fourteen towns under that category. It has fallen to seventeen with the abolition of the Haṛipād and Māvēlikara Municipalities. The Major Municipalities have Health Officers and qualified Sanitary Inspectors who attend to the Health Work relating to their towns. In regard to the Minor Municipalities not having qualified Sanitary Inspectors, vaccination verification is looked after by the Sanitary Circle Officers of the Public Health Department. The controlling officers of the Public Health Department conduct inspections and offer advice about the Health Work in Municipalities.

The introduction of a scheme for proper school medical inspection in the State had been, of late, engaging the serious attention of the Government. The School medical inspection. imperative need for providing this service, so essential for the preservation of the health of the school children, was strongly emphasised in the report of the Travancore Education Reforms Committee. The Education Department has since been keener than ever for formulating and putting into operation a proper scheme of school medical inspection. The Government having sanctioned the scheme and made the necessary appropriations for the purpose in the budget for the year 1111 M. E., the *modus operandi* of the proposal was discussed and settled in the course of a conference of the heads of the Education, Medical and Public Health Departments. It was decided to conduct school medical inspection as an experimental measure in all the primary schools of eight representative taluks in the State, viz., Nēyyāttinkara and Trivandrum in Trivandrum division, Quilon, Māvēlikara and Thiruvalla in Quilon division, and Changanāssēry, Kōṭṭayam

and Minachil in Kōttayam division. It was also settled that the work should be carried on by the Public Health Department, the staff of Sub-Assistant Surgeons needed therefor being diverted from the Medical Department. The Inspection of the progress of the work vests with the controlling agencies of both the Education and the Public Health Departments.

Staff.—Eight Sub-Assistant Surgeons borne on the staff of the Medical Department were selected for the work and transferred to the Public Health Department. They were given a course of practical training in the Health Unit, Neyyāttinkara, and in the Specialists' Sections of the General and Ophthalmic Hospitals, Trivandrum, and were posted to their respective stations, one Sub-Assistant Surgeon being stationed at each of the eight taluks referred to. The immediate supervision of the work of the Sub-Assistant Surgeons in Neyyāttinkara and Trivandrum taluks is assigned to the Assistant Surgeon in charge of the school medical inspection work in the Neyyāttinkara Health Unit, the supervision in respect of the remaining six taluks being entrusted to another Assistant Surgeon exclusively appointed for that work, with his headquarters at Thiruvalla.

Programme of work.—The programme of school medical inspection work consists of:—

- (a) A complete physical examination of the pupils,
- (b) notification of defects to the parents,
- (c) treatment of students found to be defective at the nearest district hospital or government dispensary by the school medical officers,
- (d) correction of defects requiring specialists' attention by the respective specialists,
- (e) follow-up of cases by the school medical officers by re-visiting schools about six weeks after the first visit,
- (f) inspection of the sanitary condition of the schools, and
- (g) Health Education,

In the case of specialists' treatment for defective school children at Kōṭṭayam and Trivandrum, actual conveyance charges for journeys made to and from the hospitals will be given to poor patients—students and one attendant each—certified so by the Headmaster of the school, from the hospital where they undergo treatment. The Ophthalmologist will visit the different areas of work in the moffussil once in two months and treat cases requiring his attention.

This scheme has shed new light upon the various hazards to the health of the school children, the diseases commonly prevailing among them, their state of nutrition and other allied matters. The work is pregnant with far-reaching benefits to the school-going population.

The Health Education Section undertakes public health propaganda by means of lectures with cinema and lantern shows and publication of press articles, pamphlets and bulletins. The Health Propaganda Van purchased in 1112 M. E. is fitted with Microphone, Gramophone, Amplifier and Loud Speaker. This equipment is proving itself to be very efficacious as an educational appliance for attracting and instructing large gatherings of people. The propaganda van goes to every part of the State in the course of its itineraries. Its appearance at the scheduled lecture centres allures huge concourses of people, especially in villages and festival areas. Musical lecture records on health and hygiene are played through the Gramophone Pick-up attached to the Sound Reproduction Apparatus which is also used for delivering health lectures to crowded audiences. A fairly good stock of cinema films on subjects, such as, hookworm, malaria, cholera, small-pox, tuberculosis, leprosy, rural sanitation, venereal diseases, plague, personal hygiene, maternity and child welfare, etc., is used for demonstration. The film used for propaganda on maternity and child welfare opens with the following

message so graciously granted by Her Highness the Mahārāṇi, Sēthu Pārvathi Bāyi:—

“It has given me great pleasure to learn that the Public Health Department has conceived the happy thought of popularising sound ideas regarding the fundamental problems of maternity and child welfare. On the spread of knowledge relating to them depends the health and happiness of the future generation, and there is no more instructive method to secure the end in view nor one with a more immediate appeal to all classes. I wish the experiment all success.”

Health exhibitions, health weeks and baby shows are organised with the aid of an exhaustive collection of public health models, posters, etc. A miniature Health Museum is also housed in the Central Office. These propaganda materials serve as a potent medium for appealing both to the eye and the ear and for disseminating Health Knowledge in the most impressive manner.

The attention of the student community is focussed upon public health by interesting them in health plays and dramas, school health processions, and competitive essay writing on questions of health and hygiene. Health Habits Score Cards are popularised in schools as a means of habituating the school children in their impressionable years in hygienic ways of living. Vacation Courses in hygiene are arranged to equip the teachers very well for Health Education work in schools.

Health Leagues and Committees are formed so that they may serve as help-mates for intensive Health Education work productive of permanent and sustained results. These agencies are intended to promote and popularise periodical clean-up campaigns. Lectures on health and hygiene are delivered under the auspices of educational institutions, co-operative organisations, and voluntary associations, either at their request or on the initiative of the department.

The Health Educational Branch aims at the creation of a sound Public Health conscience, which is the vital requisite for the success of every Public Health activity.

Maternity and child welfare service for rural areas.—A new maternity and child welfare scheme was introduced in 1113 M. E. for the benefit of small towns and rural areas, lacking in facilities for medical and midwifery aid. Two units each comprising a Lady Doctor and five Midwives are told off for each of the two Public Health districts in the State.

Miscellaneous. An annual expenditure of about Rs. 3 lakhs is incurred on an average on account of the Public Health services in the State.

BIBLIOGRAPHY.

Gōpāla Pillai, M. K.

Report on the Epidemio'ogy of
Cholera in Travancore (1929).

Iyengār, M. Ō. T.

Report on the Malaria and Filariasis
Surveys and other investigations
in Travancore from 1107 to 1110
M. E.

Nāgam Aiyya, V.

Report on the Rat Flea Survey of
Pirmāde taluk.

Travancore State Manual (1906).

Travancore State Administration
Reports from 1030-1104 M. E.

Administration Reports of the
Sanitary Department from 1104-
1108 M. E.

Administration Reports of the Public
Health Department 1105-1112 M.E.

Annual Reports of the Rockefeller
Foundation from 1930-1937.

The Travancore Hook Worm Survey
Report (1930).

The Travancore Medical Journals
Vols. 1-4 Oct. 1935 and July 1936.

The Travancore Census Report
(1931).

INDEX

INDEX

A

- Abkari : monopoly of, 603 ; right of sale, 603 ; right of drawing toddy, 603.
- Abkari revenue : 103. . . .
- Accounts : assessing of, 198.
- Adhikāram olivu: 146.
- Adima: 153. . . .
- Adiyarapattom : 199.
- Administration : Manual of, 125; in Perumāl period, 132.
- Adukkuvathu : a kind of viruthi, 156, 157, 158; High Court's view on, 157.
- Aduthūn Irayili: 212.
- Advisory Board : in the education department, 731.
- Aerodrome at Trivandrum : 495.
- Agave: 339.
- Agricultural colony : 405; object of, 405; nature of, 406 ; working of, 406.
- Agricultural Debt Redemption Committee : 68.
- Agricultural education : 402; in the 'demonstration farm, 402; in Malayalam Schools, 402; in agricultural middle schools, 403; training facilities, 403 ; training in agricultural schools, 403. . . .
- Agricultural farming: co-operative, 686.
- Agricultural Holdings : 287; definition of, 287; extent and size of, 7, 287, 288; average size of, 287; distribution of, 289; uneconomic holdings, 290; evils of excessive sub-division of, 290 ; consolidation of, 290.
- Agricultural implements : 293; J. A. Voelkar on, 292, 293; the plough, 293; levelling board, 295; rake, 295; harrow, 295; seed drills, 295; Inter culturing and weeding implements, 295; Kathi, 296; Kurpi, 296; weeding, 296; Digger P. C. 296; Dhundia, 296.
- Agricultural income: 18.
- Agricultural indebtedness: 64.
- Agricultural marketing: 407 ; All India marketing scheme, 407 ; marketing of agricultural products, 407, 410.
- Agricultural products: fall in price of, 63; marketing of, 407, 410.
- Agricultural research: Imperial Council of, 410; admission of the state into, 410; research work in the State, 410.
- Agricultural returns : 18, 19.
- Agricultural schools : 403; training facilities, 403; courses of training, 403; mode of training, 404; number of students trained in, 405; object of the institutions, 405.
- Agricultural stock : 25, 379, 411; condition of, 25, 26, 387; Census of, 380; Ward and Conner on, 383; import of, 383; insufficiency of, 383.
- Agriculture : 280; population living on, 280; peculiarities of Travancore agriculture, 280; causes of the peculiarities, 280; favourable conditions in the State for, 280,

- 281; characteristic feature in the State, 280; causes of development in the State, 281; area under cultivation: 280, 281, 282; Board of Agriculture, 290, 408; manure problem of, 298, 302; wet crops, 299; dry crops, 283, 317; garden crops, 284, 350; plantation crops : 285, 370.
- Agriculturists: life of, 5, 20; relative position of, 13; economic position of, 64; plight of, 65, 63, 67; relief to, 63.
- Air Transport : 494; opening of Trivandrum-Bombay Air Service, 495.
- Alienation: changes of Status due to, 123.
- Alleppey: Chamber of Commerce, 672.
- Ampalpathi: 131.
- Ānavirūṭhi: 21.
- Anchal Articles: conveyance of, 499.
- Anchal Savings : 655.
- Ānjeli: 252.
- Annexation: of Malabar, 120.
- Anubhōgam: 153, 195.
- Anubhōga Virūṭhi: 209.
- Apiaries: work in, 399.
- Apiculture: 397.
- Appeal Court: decision on the relation between Jenmies and Tenants, 162.
- Appropriation: by Jenmies, 159.
- Aquatic products: fish products, 444; other products, 451.
- Āradiyanthirāṁ fees: 155.
- Āranmuḷa kannādi: 563; composition of, 558, 563; processes of manufacture of, 563; polishing, 565.
- Ārayalam: a kind of virūṭhi, 214.
- Arecanuts: 360; places of intense growth, 360; cultivation of, 360; varieties of, 361; diseases of, 361; export of, 623; export duty of, 623; tariff value of, 623; quantity and value exported in 1102-1111, 624.
- Ārienkāvu: reserved forests in, 248.
- Arrack: consumption of, 64, 104.
- Arrow root: 332.
- Arthamāpibham: 210.
- Assess: 388.
- Assessment: permanence of, 123; trees, 226, 230; consideration in fixing, 232; on rubber estates, 339; on coffee estates, 239; prohibitory, 243.
- Assets: National, 89.
- Atṭipēr: 148, 178, 179; ceremonies pertaining to, 179.
- Attotti: 206.
- Audit: of accounts of private schools, 731.
- Avakāśam, a kind of renewal fee: 157.
- Avaiōdha Nampī: 129.
- Āyacut: 187.
- Āyacut pāṭṭom: 199.

B

- Backward communities: education of, 735; observation by Lord Wenlock, 735; efforts taken by the Government, 736.
- Bacteriological laboratory: 800; Kahn's and Hinton's tests, 800.
- Baden Powel: on jenmom tenure, 141.
- Bailing basket: 297.
- Bailing spoon: 297.
- Bamboo depot: 576.
- Bananas: 367.

Banks: general, 71; land mortgage, 68, 88; indigenous, 651; classes of, 651; functions of, 651; utility of, 651; treasuries and Anchal Saving 655; Postal Saving, 655; Joint Stock, 656, 657; Nidhi, 658; Banks having a paid up share capital of above Rs. 1 lakh, 660; chitties as impediments to, 661; Urban banks 682. . .

Basket making: 576.

Bastow : on reclamation, 29, 312; bridges designed by, 485, 486, 487.

Bee-keeping: 397; work of apicultural section, 398, 399; propaganda work in, 398, 399; experiment in, 398; training in bee-keeping, 399; work of Y. M. C. A. at Mārthāndam, 400; introduction of foreign bees, 400.

Bell-metal industry : 555; excellence in the State, 555; brass and bronze casting, 557; process of manufacture of bronze utensils, 558; decline of the industry, 558, 562; composition of alloys, 561; Āranmuḷa kannādi or bell-metal mirror, 563.

Bell-metal mirror: 563.

Betel vine : 347; cultivation of, 347, 348; varieties of, 348; uses of, 349.

Bhattuvirūthi : 213.

Black-gram : 325, 326.

Board : of agriculture, 290, 408; economic development, 87; of Revenue, 87; Road Board, 473; of Indian Road Congress, 474.

Boats : 480, 481, 482.

Boat jetties: 482.

Borrowing : necessity of, 67.

Bourdillon, T. F.: on hill cultivation, 317.

Boy Scouts movement: fundamental principles of, 741; organisation and development of, 741.

Brahmadayam : 213.

Brahmaswam properties : 146.

Brahmins : 125.

Brahmin Settlers: in Kēraḷa; 128.

Brahmōdīśam: formation of, 149.

Bread fruit, 369.

Bridges : 484; Karamanai bridge, 484; Punalūr suspension bridge, 484; built in the latter half of 19th century, 484; Nīṇṭakaṛa bridge, 485; reinforced concrete bridges, 485; Sinclair Peṛiyār Bridge, 485; Mūvattupuḷa bridge, 487; Erāppuḷa bridge, 487; Nēṇiamangalam bridge, 488; Important bridges in the State, 490.

Buildings : 12.

C

Canals : 477; opening of canals northwards from Trivandrum, 465, 478; opening of canals southwards, 478; various canals in the State, 479.

Cane working : 576.

Cardamom : 2, 39, 269, 340, 601, 626; places of growing, 269; abolition of monopoly in, 269; rules pertaining to, 269; cardamom ryots conference, 270; growing interest on the cultivation of, 270; reduction of assessment, 270; area under cultivation, 270; marketing methods, 270; morphology of, 340; uses of, 341, 342; varieties of, 341; yield, 341, 342; factors essential for cultivation, 341; cultivation of, 341; profit from, 343; export of, 626; quantity and value

- exported in 1062-1111, 626; chief markets for, 626; decline of the trade, 626.
- Cardamom monopoly, 601; condition of cardamom trade in the monopoly system, 621.
- Carpentry school: 711; commercial school, 712.
- Cashewnuts: 361; area under, 361; plantation of, 361; production of, 361, 362; export trade of, 629, 630; development of the trade, 630; quantity exported in 1106-1111, 630; quantity exported in British India, 630; markets for, 630; quantity and value of nuts exported in 1102-1111, 631.
- Cashewnut Industry: number of cashewnut factories, 527; roasting the nut, 527; preparing the nut for consumption, 528; sorting, 528; packing, 529; by-products of, 530.
- Cassava: 327; (see Tapioca).
- Cattle: 379; part of in agriculture, 379; demand for, 380, 383; census of, 380, 381, 382; import of, 383; insufficiency of, 383; breeds of, 383; size of, 383; Ward and Conner on, 383; draught cattle, 384; used for ploughing, 384; used for town requirements, 384; price of draught cattle, 385; milch cattle, 385; price of milch cattle, 385; cattle for slaughter house, 386; condition of cattle in the State, 386; efforts for the improvement of, 387, 411; goats and sheep, 388; horses and asses, 383.
- Cattle diseases: 389; treatment of, 389; contagious diseases, 390; control of, 390.
- Cattle Farm, 387.
- Central Co-operative Bank: 673, 676; Registration of, 673; capital of, 674; main objects of, 674; Government share, 674; central credit system, 676; progress of, 677; financial services of, 677; other functions of, 677; table showing the details of: 678, 679; taluk banks, 680; detailed working of taluk banks, 631.
- Ceramic industry: 516; facilities for, 516; quantity of Travancore clay, 516; opening of porcelain and China clay refining factory, 518; prospects of, 519.
- Chama: 325.
- Chamber of Commerce: 672; functions of, 672; services rendered by, 672; Alleppey, South Travancore, etc., 672.
- Chank fishery: 455.
- Charles Metcalf: on village community, 130.
- Chēmpu: 330.
- Chenthengu: 353.
- Chēnai: cultivation of, 331; as food, 331.
- Cherikkal lands: cultivation of, 199, 242.
- Cherupunna oil: 334.
- Chillies: 349.
- China clay: 517.
- Chitra home: 88.
- Chitties: institution for investment and credit, 653; classes of, 654; details of narukku and lēla chitties: 654; Chitty regulation, 654; statement showing the number and total capacity of, 655; fall of, 655; chitties as impediment to banks, 661.

Chittipannom : 215.

Chittotti: 206.

Choir: 129.

Cholam: cultivation of; 325.

Cholera: frequent visitations of. 774, 775; Cholera Vaccine inoculation as a remedy, 776; epidemiology of, 776.

Chorā otti: 206.

Chryso beryl: 539.

Chūṇṭappana: 338.

Clay: varieties of, 516.

Coconut: area under cultivation, 31, 351; principal industries connected with, 31, 506; value of the products of, 31, 616, 617; fluctuation of area under cultivation, 32; fall in price of, 32; condition of the industry, 33, 619, 620; rates on, 235; places suited for cultivation, 350; tracts of, 350; cultivation in other countries, 352; varieties of, 353, 354; yield, 354; profit from, 355; annual production, 355; consumption of, 355; cultivation of, 355; cost of cultivation, 356; working cost of coconut cultivation, 356; protection to growers, 618; problem of competition from Ceylon, 33, 618; coconut enquiry, 411; extraction of toddy from, 571; jaggery from, 571. export of, 610.

Coconut diseases: 357; root disease, 357; diagnosis of the disease, 358; remedy for root disease, 359; causes of root disease, 359; leaf rot disease, 359; leaf blight disease, 360; research grant for, 410.

Coconut Industry: coconut oil industry, 506; coir yarn industry, 509; mats & mattings, 513; com-

petition from Ceylon, 33, 619; condition of, 33, 619, 620; ways of improvement, 619, 620.

Cocoanut oil Industry: 506; centres, of, 506; appliances used for the expression of oil, 507; extraction of oil, 507; price of oil, 616; export of, 612-616.

Cocoanut problem: 411, 618; competition from Ceylon, 33, 618, 619; condition of cocoanut industry, 619; ways of improvement of, 619, 620.

Cocoanut products: cocoanut oil, 506, 616; punnac, 508; coir yarn, 509, 616; coir fibre, 511; mats and matting, 513; export of, 611, 612, 613, 614, 615, 616.

Co-education : 696; introduction of, 694, 696; in principal schools, 696; rapid advance of, 697; D. P. I. on, 697; defects of, 698; considered opinion on, 698.

Coffee: Plantations, 370, 372; Pioneers of coffee planting in the State, 370; concessions to planters, 370; beginning of plantations, 370; causes for abandonment of coffee cultivation, 371; failure of plantation, 371, condition in 1936, 371- varieties successfully cultivated, 371; export trade of, 635; quantity and value of coffee exported, 635.

Coinage, 645.

Coir fibre: 511, uses of, 511.

Coir yarn: price during the years 1102 to 1111, 616; fall in prices of, 616.

Coir yarn industries : 44, 509; conditions of, 509; importance of, 509; spinning of coir yarn, 510; varieties of yarn, 511; uses of coir

- yarn, 512.
- Cold Storage: 444.
- Collection: of taxes, 240.
- Colleges : Kōṭṭayam College handed over to the church mission Society, 699; affiliation to the University of Madras, 700; foundation of Mahārāja's College of Science, 701; Mahārāja's speech, 701; endowments to Mr. John Ross, 702; legal training, 703; restriction of admission into, 731.
- Commendatio : 143.
- Commendation : existence of, 143, 144.
- Commerce : in ancient times, 579; commercial relation with Portuguese, 580, 581; commercial relation with Dutch, 580; beginning of commercial relation with English, 581; commerce till 1850, 581 to 584; development of commerce after 1850, 585; Interportal convention facilitating, 586; commercial intercourse between Travancore, Cochin and Malabar, 485; Alleppey chamber of commerce, 672; commercial school, 712.
- Communicable diseases : control of, 773; small-pox, 773; cholera, 774; malaria, 777; typhoid fever, 779.
- Communications : means of, 49, 275, 465; in forests and forest regions, 275; various means of, 465; state of communications till 1860, 460; progress made, 467; through land, 465; through water, 477; Railways, 491; motor traffic, 494; through air, 495; State Transport, 495.
- Compensation : claims to, 160.
- Concessions : Kannan Devan hills, 275; Periyar lease, 275.
- Conciliation board : utility of, 71.
- Condiments : 284, 340; cardamom, 340; pepper, 343; ginger, 346; turmeric, 347; betel vine, 347; chillies, 349; tamarind, 349.
- Confiscation : of Jenmom lands, 132.
- Conservancy regulation : classes and conditions of, 2-3.
- Conservancy stations : 805; rural sanitations, 805.
- Consumer's Societies, 687.
- Contract : Kānappāṭṭam, 172; importance of the terms of, 172.
- Co-operation : different works of, 76, 77, 673; among fishermen, 396; non-credit activities, 684.
- Co-operative Banks: Central Co-operative Bank, 673, 676; Taluk Banks, 680; Urban Banks, 682.
- Co-operative dairying, 685.
- Co-operative farming : agricultural, 636.
- Co-operative insurance : 685.
- Co-operative Societies : 76, 656, 673; rural reconstruction works by, 76, 686; co-operative societies regulation of 189, 673; object of the Regulation, 673; progress of the movements, 673; registration of the central co-operative Bank, 673; Agricultural credit societies, 674; Registrars and inspectors of, 675; total No. of, 676; non-credit activities, 676, 684; Taluk Banks, 680; Urban Banks, 682; Primary Societies, 682, societies for backward communities, 682; non agricultural societies, 683; Internal supervision, 684; House building societies, 686; Women's societies, 686; marketing societies, 637; commer-

- cial societies, 687; School and college societies, 687; concessions granted by the Govt to, 688.
- Copra : preparation of, 507; kinds of 507; oil content of, 507; extraction of oil from, 507; price during the years 1102—1111, 617; fall in price of, 32, 33, 617; export of, 33, 609, 610, 612, 617; demand of copra in Indian markets, 617, 618, variation in the tariff value of, 618; import of Ceylon copra, 33, 618.
- Corals : 453; nature of, 453; varieties of, 453; existing places in the coast, 453; collection of, 453; value of corals collected, 454; commercial classification of, 454.
- Cottage Industries : 44, 543; various kinds of, 44, 45; coir spinning, 44, 45; bee-keeping, 397; poultry, 430; as a subsidiary profession, 543; excellence of the state in, 44, 543; important ones, 543; cotton weaving, 544; silk weaving, 54 ; manufacture of gold and silver threads, 552; lace and embroidery, 552; bell metal industry, 555; iron industries, 565; screw pine mat weaving, 566; wood seasoning, 568; palm leaf umbrella making, 569; jaggery manufacture, 571.
- Cotton weaving, 544; condition of the industry, 544, 545; No. of workers engaged in, 545; condition of workers, 545; Institution to instruct, 545, 546; government aid, 546; income derived from, 551; bordering with gold lace, 551.
- Cotton goods: import of, 642, 643.
- Cotton yarn : import of, 642, 644.
- Cow pea : 327.
- Cows : 385.
- Credit Bank : 663; utility of, 663.
- Credit : medium of, 651, institution of, 653.
- Crops : plantation crops, 2, 39, 285, 370; general conditions of, 39; various crops in the state, 282; system of rotation crops, 292; cultivation of wet crops, 292; Podi vitha, 302; Nīr vitha, 308; fibre crops, 337; dry cultivation crops, 317; garden cultivation crops, 282, 284, 350.
- Cultivation : 18; extension of, 18; progress in, 20; facilities for, 21; of paddy, 28, 101, 299, 325; of coconut, 31, 350; sugar cane, 36, 362; pepper, 37, 343; cardamom, 2, 39, 269, 340; Tobacco, 39, 340; of paddy in Nānjanād, 311; of paddy in Onāṭṭukara, 309; of paddy in Kuṭṭanād, 311; of paddy in Hills, 317, 318; of cholam, 325; of pulses, 325; of dhal, 327; tapioca, 34, 327, 328; kāchil, 329; chāmpu, 330; chinai, 331; gingely, 331; ground nut, 333; of fibre crops, 337; ginger, 346; turmeric, 347; Betel vine, 347; chillies, 349; tamarind, 349; arecanuts, 360; cashewnut, 361; sugarcane, 362; of vegetables, 364; of plantain, 365; bananas, 367; mango, 368; jack, 368; pine apple, 369; bread fruit, 369; of coffee, 370; of tea, 372; rubber, 377.
- Currency : 645.
- Customs : 113, 118, 119; relating to rent and other duties, 170.
- Customs duties : duty on once duty paid goods, 584; customs based on Interportal Convention, 587.

Customs Revenue of 1030 and subsequent years: 585; loss due to Interportal Convention, 590; compensation for the loss, 590, 591.

D

Dairying : co-operative, 685; object of, 685; cattle breeding society, 685.

Dānapramāṇam : 211.

Death-rate : 772.

Debts : suggestions to settle, 68.

Debt Redemption Committee : on plight of agriculturists, 68.

Deeds : insistence on unambiguous phraseology in, 167; kāṇapāṭṭom deed to be governed by the terms expressed in, 167.

Depression : economic and general, 65.

Dēśādhipat̥hyam : 131.

Dēśam : 129.

Dēśam oḷivu : 129.

Dēśavālis : 131.

Destitute home : 88.

Dēvadar Committee : 687; recommendations by, 687; improvements of co-operation, 688.

Dēvādāyam : 213.

Dēvaswom properties : 124, 146.

Digger : 296.

Director : of public instruction, 716.

Disafforestation : 250.

D'Lannoy : 214.

Drugs : 284, 340.

Dry cultivation crops : 283, 317; paddy as malankrishi, 317; chōlam, 325; pulses 325; Ragi, 325; chāma, 325; thena, 325; tapioca, 327; kāchil, 329; chēmpu, 330; chēnai, 331; sweet potato, 332; arrow-

root, 332; gingelly, 332; ground-nut, 333; punna, 334; cherupunna, 334; iluppa, 335; maḥaveṭṭi, 335; kaṇinjōtta, 336; pūvam and pungu; 336; margosa, 336; drugs and narcotics, 340; condiments and spices, 340; cardamom, 340; pepper, 343; ginger, 346; turmeric, 347; betel vine, 347; chillies, 349; tamarind, 349.

Dues : summary recovery of, 173.

Durghasu pattom : 198.

E

Ebony : 252.

Economic condition : 1; general, 1; in the beginning of 19th century, 3; of agriculturists, 13, 64.

Economic depression : 63.

Economic Development Board : 87, 88.

Edappalli Rāja : dēśams of, 145.

Edappalli : subjection of, 188.

Edavakai chiefs : absolute proprietorship of, 137; magisterial powers of agents, of 190.

Edavakai Regulations of 1109 : 187, 189; privileges conferred on the chiefs and their tenants by, 189.

Edavakais : 131, 186; definition of, 186; general characteristic of, 186; origin and nature of : 187; Kilimānūr, 187; Edapalli, 188; Pānjār, 188; Vanjippulā, 188; Edavakai villages, 189.

Edible roots : 283, 327; tapioca, 34, 327; Kāchil or yam, 329; chēmpu, 330; chēnai, 331; arrow root, 332; sweet potato, 332.

Education : 691, 757; early account, 691; Queen Rāni Pārvathi Bai's

- laying of the first foundation of, 691; progress during the reign of Sri Mūlam Thirunāl, 691, female education, 692; Madhava Rao on female education, 692; progress of female education, 693, 695; co-education, 694, 696; progress of co-education, 697; D. P. I. on co-education, 697; recommendation of Hartog committee, 698; missionary enterprise, 698; State activity in education, 700; Vernacular education, 704; English education, 708; technical education, 709; progress of education, 714; educational reforms, 714; educational code, 717; private enterprise, 721; endowments, 726; education of Muhammadans, 732; reformatory education, 734; education of back-ward communities, 735; co-ordination of education with means of living, 742; Travancore University, 744; free primary education, 716.
- Educational reforms:** 714; Education Secretary to Government, 714; the personnel of educational staff, 714; classification of English and Vernacular schools, 714, 715; inspection staff, 715; bifurcation, 715; other important reforms, 716; training of teachers, 716; administration of girls schools, 716; Director of Public Instruction, 716; education code, 720; Financial assistant to the Director, 731; establishment of Advisory Board, 731.
- Educational reforms committee :** 727; observations of Statham Committee, 727; its suggestions and government approval, 728, 731.
- Eggs :** market for, 77; export of, 77; value of exports, 78; marketing of, 411, 418; grading and packing station, 411.
- Ejection :** from land, 162; controversy over, 162; contentions against, 163.
- Electric power :** 47, 498; for the use of Kannan Devan Hills produce, 498; hydro electric possibilities in the state, 47, 48, 498; necessity of electric power in the state, 47, 498, 499; power house at Trivandrum, 500; Pallivāsal hydro electric scheme, 502; demand for power by industrial and agricultural concerns, 503; power house at Quilon, 501; power house at Kōttayam, 501; power house at Nagercoil, 501.
- Elementary education :** the committee's opinion, 722.
- Elephants :** 268; devices for capture of, 268.
- Embroidery :** 554; drawn thread-work, 554; church embroidery, 554; crochet and knitting, 558.
- Employment :** uncertainty of, 3.
- Endemic areas :** 789.
- English education :** 708.
- English schools :** 693; first started, 698; establishment of, 698; Rāpi Lekshmi Bai's donation to, 698; scholarships in schools, 701; free schools, 704.
- Enquiry commission :** on the condition of the proprietors, 170.
- Entomological laboratory :** 802.
- Escheat :** 120, 191; confinement of, 122; right of, 136; cases of, 196.

Estates : coffee, 370; causes of abandonment, of coffee estates, 18; Kilimānūr and Edappally, 241; tea-estates, 372; rubber estates, 377.

Ettartham : capitalised value of micchavāram, 159.

Etṭuvittil Pillamār : 144.

Eviction : limitations from, 118; right of eviction, 162; Appeal Court's decision on, 162; Jenmi Commission report on, 164; sanction for, 172; circumstances leading to, 172.

Expenditure : estimate of, 81; of family, 84.

Export duty : in 1030, 584; according to Interportal Convention, 587, 591; of pepper, 621; of arecanuts, 623; of timber, 625; of tea, 627.

Exports : 608; main items of, 51, 608; condition of, 52, 609; difference in value of imports over, 52; countries exported to, 94; of articles, 195; of fish, 438, 439; duty levied on, 584; value of articles exported in 1101-1110, 609; decline in the export of coconut products, 611; quantity and value of coconut products exported, 612; fall in the export of copra, 617, 618; causes of fall in the copra, 617, 618, 619; of pepper, 620; quantity and value of pepper exported in 1102-1111, 621; of ginger, 622; of turmeric 623; of arecanuts, 623; of tapioca, 624; of timber, 625; of cardamom, 39, 625; of tea, 39, 626; of rubber, 39, 629; of cashewnut, 629, 630; of fish, 631; of hides, 632; of jaggery, 632; of palmyra fibre, 633; of

molasses, 633; sugar candy, 634; lemongrass oil, 634; coffee, 635; tariff value in 1030 and subsequent years, 585.

Extra-cess : 240.

F

Factories : number of, 506; hands employed in, 506; factory industries, 506; coir factories, 509, 513; tile factories, 516; ceramic, 518; sugar factory, 519; rubber factory, 523; tea factory, 523; cashewnut factories, 527; salt factories, 531, 532; monozite factory, 537; ilmenite factory, 538; match factory, 541; regulation of, 542.

Factory-industries : 506.

Factory-workers : wages of, 96.

Fallowing : 291; meaning of, 291; various methods of, 291; practices contradictory to, 292; in kāyal lands, 312; in Kuṭṭanād, 291; in malankrishi lands, 292; in wet lands, 291, 292; in dry lands, 292.

Famine : causes of, 85; seasons of scarcity, 64, 85.

Fees : due to jenmi, 156, 157.

Female-education : 692; Madhava Rao's opinion on, 692; rapid improvement of, 693; second grade college for girls, 693, 694, 695; syllabus for girl's education, 694; Hartog committee's recommendation on, 693.

Ferries : total number of, 484.

F. Bancrofti-infection : 793.

Fibre-crops : 234, 337; monocotyledonous, 337; screw-pine, 337; chūṇṭappana or olaṭṭippana, 338; karimpana, 338; coconut, 338; plantain, 338; dicotyledonous, 338;

- cotton, 339; agave, 339; sunhemp, 339.
- Filarial : control work, 737; in Sherthala, 797, 798.
- Filariasis : field station, 794.
- Filarial : inspection, 791.
- Filariasis survey : 791.
- Financial-assistant : to Director of Public Instruction, 731; appointment of, 731.
- Fish : export trade of, 631; quantity and value exported, 631; total catch of the world, 432; total catch of the state, 432; varieties yielding oil, 445, 515; various species of, 434; total quantity landed every year, 435; classification of fish caught, 436; export of dried fish, 438.
- Fisheries : 390, 431; in early days, 431, 432; importance in maritime countries, 432; natural advantages in the state, 432; position of Travancore in fishery, 432; fishing grounds in the state, 432; area available for tapping, 433; area actually harvested, 433; yield of Travancore fishing grounds, 433, 434; yield of world fisheries, 434; scope in the state, 433, 434; chank fishery, 435; fish products, 444; other aquatic products, 451. facilities for, 390; piscicultural operations, 393.
- Fishing : superiority of Travancore waters, 433; control of, 391; nets used for, 433; other implements used, 391; in back waters, 390.
- Fish-breeding : 393.
- Fisheries department : 390.
- Fishing-gears : 393.
- Fish-industry : 45; exports of products of, 45; suggestions to improve, 45.
- Fish manure : 449.
- Fishermen : education among, 396; socio-economic works among, 396;
- Fish-meal : 449.
- Fishing-vessels : 433.
- Fish-products : 444; shark fins, 444; fish-oil, 445; fish manure, 449; fish meal, 449; isinglass or fish mass, 449; fish skin, 450; other miscellaneous, 454.
- Fish : preservation of, 392, 436; problem of, 436; necessity for, 436; principle of, 436; methods of, 394, 437; quantity preserved by drying, 438; quantity preserved by salting, 439; cold-storage plant, 444; fish-curing, 392, 394.
- Fish-protection : regulation for, 391.
- Fish-oils : 445, 575; oils from sardine, 445; shark liver oil, 446; tests for sardine and shark liver oils, 446; oil-yielding fishes, 575.
- Floods : havoc of, 437.
- Fodders : 364; guinea grass, 365; napier grass, 365.
- Food : staple food of population, 638.
- Forests : 247; extent of, 247; Bourdillon's report on, 247; statement showing the area of reserves, 249; value and utility of, 250; Schillie's view on uses of, 250; Bourdillon's classification of, 251; need for preservation of, 255; working plans of, 260.
- Forest Department : receipts and expenditure of, 271.

Forest flora : diversity of, 253; varieties of timber, 254; flowering plants, 254.

Forest offences : 274.

Forest produce : exploitation of, 261; divisions and sub-divisions of, 261; utility of timber, 261.

Forest protection : 271; injuries to which forests are exposed, 272; injuries from fire, 272; measures to prevent forest fires, 273.

Forfeiture : specification of, 172.

Free-hold : a division of jenmom land, 145; details of lands under, 145; change in status of, 146.

Fruits : 285, 365, 370; plantains, 365; bananas, 367; mango, 368; jack, 368.

Fruit-farm : 369; objects of, 369; varieties of fruit trees grown in, 369.

G

Game : protection of, 277; rules relating to, 278.

Games and athletics: 731; encouragement given to, 731.

Ganja : 103; consumption of, 106; issue price of, 107; as a narcotic, 340; monopoly of, 602.

Garden tax : 234; assessment and rates for trees, 238.

Garden crops : 282, 284, 350; coconut, 350; arecanut, 360; cashew-nut, 361; sugarcane, 362; vegetables, 364; fruits, 365.

Gaulipāthram : a variety of coconut, 353.

Ghamela : appliance for irrigation, 297.

Gingelly : 332; varieties of, 333; cultivation of, 333; uses of gingelly oil, 333.

Ginger : 346; cultivation of, 346; area under cultivation, 346; uses of, 347; foreign markets for, 622; tariff value on, 622; fall in prices of, 622; value and quantity exported, 622.

Girl guide movement : 741; chief guide, 741.

Goats : 388.

Goods: imported, 82.

Government concessions : to co-operative societies, 688, 689; remission of registration fees, 688; exemption from income tax, 688; publication of annual accounts and audit reports, 688; recovery of dues from government servants, 689; free assignment of pūdual lands, 689; contract works placed with societies 689.

Government proprietorship : 190; disposal of government land, 244.

Grams : cultivation of, 325.

Grāmādhīpatis : madampies, 131.

Grāmams : 129.

Grazing : 273; necessity of reserves for, 273; area reserved for, 274.

Grazing lands : demand for, 364.

Ground tax : determination of, 226.

Guild : or body corporate, 137.

Guṛudakṣhiṇa : 211.

H

Harijans : hostels for, 739.

Harrow : use of, 295.

Harvesting : implements used for, 297.

Health unit : Neyyāttinkarā, 803.

Hides : quantity and value exported, 632.

Hill-paddy : cultivation of, 317; varieties of, 319.
Hill-tribes : 277; number of, 277; divisions of, 277.
Hindu-social-system : unit of, 137.
Holdings : of various chiefs and Māṭampimārs, 147; details of, 147; renewal of, 175; agricultural, 287.
Honey : extraction of, 397, 460.
Hook-worm : survey and treatment, 762, 799.
Horses : 388.
Horse-gram : 326.
Hostels : 739; for Harijans, 739; boarding houses, 739.
Humanitarian Co-operative Society : 735.
Hundis : forms of, 664.
Hundi-merchants : origin of, 651; banking business of, 652; nature of their business, 652; causes for the failure of, 652; relation with trade, 652.
Hydro-electric scheme : at Pallivāsal, 47, 502; advantages of, 47.

I

Ilmenite : 537, 538; industry in the state, 537; uses of, 537.
Iluppa : 335.
Imperial Bank of India : 657; its branches, 657; Treasury work of the Government of Travancore, 657; Government account in the Bank, 657.
Imports : 52; condition of, 52; difference in value over exports, 52; of goods, 82; value of, 636, 637; of paddy and rice, 638, 642; of pulses,

sugar, etc., 642; of cotton yarn, piece goods etc., 342; tariff value in 1930 and subsequent years, 585; duty levied on, 584; per capita value of, 696.
Import duty : 584; according to the Interportal Convention, 587; of foreign goods, 591; of tobacco, 589; imposition on foreign copra, 617, 618; on Ceylon copra, 618.
Improvements : compensation for, 159; claims to, 160.
Inams : conversion of old tenures into, 185; grants of, 207; classes of tenures under, 207 to 213; personal, 208; kinds of, 208; abolition of, 223.
Income : total private, 78; per capita, 78; sources of, 78; national, 31; ruler's, 130.
Industries : 40; kinds of, 40, 44, 45; population supported by, 41; percentage of population engaged in, 41; preponderance of cottage, 42; factory, 42; large scale, 42; Government enterprise in, 42; cottage, 44, 543; coir spinning, 44, 45; fish, 45; mineral, 46, 536; organised, 57; salt, 42, 531; textile, 44; operatives engaged in, 57; wages prevalent in, 58; population supported by, 505; coconut oil industry, 506; coir yarn industry, 509; mats and matting, 513; oil industry, 515; tile industry, 516; ceramic industry, 576; sugar industry, 579; tea, 523; cashewnut industry, 527; paper industries, 541; match industries, 541.
Institutions : easy access to educational, 2.

Insurance : the State Life, 656; government servant's branch, 656; public branch, 657; causes for increase of providential insurance companies, 669; Regulation III of 1108 and its purpose, 670.

Interportal Convention : 586; circumstances leading to the convention, 586; terms of, 587; Mahārāja's notification, 587; notification of Madras Government, 588; compensation for the loss of the state, 590; goods excluded from convention, 591.

Investments : total volume of, 75.

Irrigation : 21, 296; artificial, 21, 287; appliances for, 296; with pikota, 296; with bailing spoon and the bailing baskets, 297; with water wheel, 297; ghamela or mohte, 297; with water pump and steam pump, 297; minor appliances for, 299; necessity of, 414; in Nānjanād, 414; tanks, 421, 422; controlling of, 422; in Chirayinkil, 422; in Neyyāttinkāra, 422; in Nedumangād, 422; in Trivandrum, 422; in Shenkōṭṭa, 423; in North Travancore, 424; by electric power, 427; area and volume of water spread from Pēchippāra reservoir, 429; expenses on account of, 428; lands under Kōthayār Project, 423.

Irrigation : division, 422; jurisdiction of, 422; object of, 422; Maramathu Department, 414.

Irrigation-officers : 421; powers of, 422.

Irrigation-works : maintenance of, 421; major or minor, 421; in North

Travancore, 424; Thalayār right-bank channel, 424; Kānthallūr dam, 424; government scheme, 424; scope for, 427.

Iron-industries : 565; condition of industry in the state, 565; tempering the steel, 565.

Isinglass : 449.

Ivory : 271.

J

Jack fruit : 363.

Jaggery : 362, 571; from sugar cane, 362, 363; export trade of, 632; quantity and value exported, 632.

Japti-Ayanzufti : 201.

Jenmi : definition according to Madras Revenue Register, 135.

Jenmies : Brahmīn, 120, 122, 123, 125, 134; right of, 126; inheritance to the title, 134; territorial sovereigns, 134; free holders, 135, 145; rights and privileges of, 137, 159; evolution of, 137; Nāyar Jenmies, 144; appropriation by, 159; other rights of, 159; obligations of, 160; relations with kudiyaṇs, 161.

Jenmikkaṛam : incidence of, 175; fixity of, 175; proportionate to Sirkar tax, 175; payment of, 176; collection of, 176.

Jenmi Kudiyaṇ : Amendment Regulation, 174; Regulation XII of, 1108, 174; importance of, 174; Jenmi's status, 175; Jenmikkaṛam fixed, 175; other important changes, 175, 176; collection of Jenmikkaṛam, 176; compensation due to Jenmi under land acquisition regulation, 176; period

- of limitation for the recovery of Jenmikkaṛam, 176.
- Jenmi Kudiyan Committee : 142, its view on Jenmon tenure, 142.
- Jenmi Kudiyan Regulation V of 1071: 172; definition of Jenmon land according to, 172; scope and limitation of kudiyan's rights, 172; specification of the grounds of forfeiture, 172, 173; renewals; 173; commutation of customary dues, 173.
- Jenmi Kudiyan Rights : royal proclamation regarding, 163; the Magna Charta of Travancore ryot, 169.
- Jenmom : 116, 122, 123; birth right over lands by Brahmins, 125; definition of, 133; antecedent to sovereign right, 126; Sir T. Madhava Rao's view on, 133; inheritance of, 134.
- Jenmom lands : 126; Kunjuraman Nayar's view on, 123, 136; origin of, 129; classes of, 145; belonging to Pagōda, 145; of brahmaswoms, devaswoms and māṭampimārs, 123, 124; privileges attached to registered, 125; Dewan Sēshaiah Sastri's view on, 135; Logan's view on, 137; several classes of, 145; definition of, 172.
- Jenmi : land-lord, 134; difference between the two, 134.
- Jenmi pāṭṭom : 155.
- Jenmom property : 134; origin of, 134, equivalent to allodial property, 134, 144; Sēshaiah Sastri's view on, 135; Brahmaswom and Devaswom, 135; Kunjuraman Nayar's view on, 136; Logan's view on, 137; Charles Turner's view, 142.
- Jenmi's rights : 141, 173; Baden Powell's view on, 141; criticism of his theory, 142; validity of the sales of, 173.
- Jenmi and Tenant : 162; Madhava Rao's view on relation between, 162.
- Jenmom Tenure : conditions of, 123, peculiarities of, 123; normal conditions of, 123; alienation of lands under, 123; incidence of Rājābhōgam, 124; micchavāṛam, 124; Sirkar interference with, 123, 124; origin of, 133; characteristics of 135; Jenmi Kudiyan Committee's view on, 142; existence of commendation, 144.
- Joint-family : unit of the society, 129.
- Joint-stock banks : 656, 657; number of registered, 657; Imperial Bank of India, 657; Nidhi, 658; Permanent Fund, 658; growth of joint-stock banks, 659.
- Joint-stock companies : 73, 666; commercial corporations, 666; registration under company law, 666; regulation 1 of 1063, 666; encouragement to joint-stock enterprise, 666; general characteristics and chief results of, 666; classification of companies limited by shares, 667; table showing the number of, 668; institutions incorporated outside, 669; abstract of, 671.

K

- Kācchil : 329; cultivation of, 329; yield, 330.
- Kadamuri : 183.
- Kaippada Otti : 178.
- Kalakam : 129.
- Kalaśavaṇi : 155.
- Kamesam, Mr. : 276; services rendered by, 276; preservation of wood by, 276.
- Kāvam : definition of, 138; distinguishing characteristics of, 172, 202; renewable but not redeemable, 166.
- Kanakkar : 138.
- Kanamdar : 124.
- Kānappāṭṭom : definition of, 147.
- Kānappāṭṭom leases : renewals to be based on principle, 170; custom regarding rent and other dues, 170.
- Kānappāṭṭom tenant : circumstances prejudicial to, 118, 119; conflict of opinion and custom regarding, 119; clear custom governing, 119.
- Kānappāṭṭom tenure : 147; origin of, 147; nature of, 147; Jenmi and Kudiyan Committee's view on, 148; military origin of, 148; irredeemability of, 150; Madhava Rao's view on, 150; Kunjuraman Nayar's view, 152; main features of, 155; time limit of, 155; custom and utility regarding, 168; against redeemableness of, 168; importance of the terms of contract in, 172; renewal of, 173.
- Kandappāṭṭom : 195, 199.
- Kandukrishi department : 193.
- Kandukrishi lands : 133; nature of, 192.
- Kannan Devan Produce Company : 498.
- Kappal thengu : 353.
- Kaṛa : 129.
- Kaṛamoliṇu : 219.
- Kaṛamoliṇu sarvamanibham : 210.
- Kaṛampathippu 186, 201; rules relating to, 186.
- Kaṛāthil chilavu : 222.
- Kāṛāma : 182.
- Kaṛi lands : 316; area of, 316; natural condition of, 316; method of cultivation in, 316.
- Karikkur pattam : 200.
- Karinchotta oil : 336.
- Karimpana : 338.
- Kathi : 296.
- Kaviyoor pagoda : 206.
- Kāyal lands : 312; help given to cultivators of, 312; method of cultivation in, 312, 313.
- Kayarviṛuthi : 217.
- Kēṛāḷa country : 125; traditional origin of, 127; characteristic of, 125; ancient organisation of, 129.
- Kēṛāḷolpathi : 117, 132.
- Kēṛāḷa māhāthmyam : 117.
- Ketteluthu : 224.
- Khurpi : 296.
- Kilimānūr : origin of : 187.
- Kindergarten school : 735.
- Kōḍāli viṛuthi : 205.
- Kōthayār project : 301, 415; first attempt, 415; scheme of, 416; Jopp's scheme of, 417; sanctioning of the scheme, 417; construction of, 417; improvements to,

- 418, 419; channels, 418; area irrigated by, 420; area of water spread, 429.
- Koṭṭuviruthi : 217.
- Kōviladhikārikals : 131.
- Kudijenmom : 133. alienated jenmom land, 185.
- Kudippullithanathu : a kind of tenure in Shertalai Taluk. 231.
- Kudiyān : 148; rights and duties of, 160; heritable and transferable rights of, 172.
- Kudiyiruppu : 211.
- Kudumbapporuthi : 211.
- Kulathupuḷa : 248.
- Kuḷikkānom : 152, 177, 178.
- Kunjuraman Nair : 128; his opinion on origin of Jenmom lands, 128; on Jenmom tenure, 128; on Kānappāttom, 152.
- Kutbakappāttom : 193; lands including, 221.
- Kūthuviruthi : 217.
- Kuttanād : cultivation of paddy in, 291, 311; fallowing in, 291; natural condition in, 311 taluks comprised by, 311; area cultivated in, 311; kayal lands in, 312; varieties of paddy cultivated in, 315. kari-lands, 316.
- Kuvaraku : 325.
- L**
- Labour : 55, 542; of serfs and slaves, 55; freedom of contract, 56; Mateer's opinion on the condition of, 56; demand of 60; condition of, 542; wages, 542; labour association, 542.
- Labourers : wages of, 96, 99, 542.
- Lace and embroidery : 552; origin of, 552; Syrian embroidery, 552; pillow lace, 552; net lace, 553.
- Lakes : 477, connection by canals, 477.
- Land: tendency to sell, 2; fluctuation in value of, 9; area under occupation, 29; area and value of, 6, 8; assignment of, 8; tax, 86, 116; ownership of, 119; rights over, 120; division among tribes, 125; Sovereign's right over, 126; land owning communities, 132; thanathu, 133; kandukrishi, 133; conservancy of, 243; one of the agencies of production, 116; main classifications of, 116; fixity of tenure of, 116; principles of ownership and possession of, 116.
- Land acquisition : Jenmi's share during, 176.
- Land assignment : basis of, 245; Regulation in of, 1097, 245.
- Land Conservancy Regulation : 189.
- Land laws : of Travancore, 167, 168; Mādhyava Rao's view on the nature of, 167, 168.
- Land lord : 134.
- Land Mortgage Bank : 88.
- Land property : personal and individual, 125.
- Land Revenue : introduction of, 141; after Mysorean conquest, 141; administration of, 225; changes in, 225.
- Land taxes : 224; early history of, 224; basis of, 224.
- Land tenures : 116, 245; defects of laws relating to, 116; fallacious theories of, 117; exceptional character of Travancore land tenures 117; various rules relating to, 245.

Leases : miscellaneous, 198; different names of, 153.
 Leather : from fish, 450.
 Lemon grass oil : export trade of, 634.
 Levelling board : 294.
 Libraries : 742; establishment of, 742; reading rooms, 742.
 Liquor : sweet, 574; tapping for, 571.
 Live-stock : 379; part in agriculture, 25, 379; condition of, 25, 26, 387; demand for, 380; census of, 380; import of, 383; breeds of, 383; Ward and Conner on, 383; draught cattle, 384; problem of, 386; Cattle-Farm, 387; suggestions to improve, 26; efforts of the Cattle Farm 387, Efforts of Imperial Council, 411; veterinary relief to, 388.
 Livery of Seisin: 180.
 Loans : 72.
 Logan : on jenmom tenure, 137; on kānom tenure, 137.

M

Mādampimar : 123, 131; characteristics of jenmom lands held by, 124.
 Mādhava Rao, Rāja Sir T.: on output of wealth, 14; on jenmom, 133; on kānapāṭṭom, 150; on female education, 692.
 Magna Charta : Travancore ryot's, 169.
 Mahārāja : Sthanam properties of, 193.
 Malabar : annexation of, 120.
 Malankrishi : fallowing for, 292; paddy as, 317.
 Malaria : 777, 795, 799; field stations, 795; programme of research work, 795; species of Anopheles 795; causes for outbreak of, 777; extensive measures to control, 778; havoc of malaria in the south, 778; protection from malaria, 778; Mahārāja's visit to malaria-stricken areas, 779; King's message, 779; statement showing varieties of, 790; mosquito vectors of, 790.
 Mālaviṛuthi : 217.
 Malayāttūr : 248.
 Māmānkam : 117.
 Maṇḍapakurathīrcha : 213.
 Mango : 368.
 Mānibham : 210.
 Manikantēwaṛam pagoda : 145.
 Manual : administration, 125; by Mac Lean, 125.
 Manual training: and spinning, 725.
 Manure : cattle manure, 298; artificial fertilisers, 299; problem of, 449; insufficiency of cattle manure 298; fish manure, 449; experiments in, 324.
 Manusmrithi : 127; recognition of acquisition of title by occupation by, 126.
 Maplahs : 125.
 Maravetti oil : 335.
 Mārāyapāṭṭom : 153..
 Margosa : neem or, 336; uses of various parts of, 336; medicinal value of, 337; oil of, 337.
 Marine wealth : of the state, 433.
 Marketing societies : utility of, 687.
 Market : sanitation of, 806; various kinds of, 53; state-control of, 53; taluk-war distribution of, 54.
 Mārthāndom : rural reconstruction at, 75, 76.
 Mārthānda Varma : 128.
 Maṭapram : 213.

Match industry : 541.
Mateer : on the occupation of people, 15; on the condition of trade, 56.
Maternity and child welfare service : 812; for rural areas, 812.
Mathilakom Service Inām Proclamation of 1110 : 223.
Mats and mattings: 513; introduction of, 513; fibre mats, 513.
Measurement: new standards of, 226.
Medical Inspection : of pupils, 740.
Melotti : Melkānom or, 205.
Melvāram : 199.
Metal mirror : 563.
Mhote : 297.
Mica : 536.
Micchavāram : 123, 124.
Micchavāra otti : 182.
Milch cattle : 385; condition of, 385; price of, 385; demand for, 385.
Millets : 283.
Minerals : 536; mineral possibilities, 536; monozite, 537; ilmenite, 538; zircon, 539; other kinds of, 539; used for refractive industry, 540.
Mineral industry : 46; government control of, 46; different kinds of, 46.
Mining industries : 536.
Missionary enterprises : their services, 698; in the field of education, 698.
Mitchel, Theodore, 491.
Miteduppu pāṭṭom : 201.
Molasses: quantity and value exported, 633.
Money-lenders: 653; number of, 653; financing agriculture, 653; business in agricultural centres, 653; loans, 653.
Monopoly: 582, 595; origin of, 594; of pepper, 595; of tobacco, 595;

evils of tobacco monopoly system, 596, 597; abolition of tobacco monopoly in British India, 597; of salt, 600; of timber, 601; of cardamom, 601; of opium and ganja, 602.
Monsoons: in the state, 286; favourable to agriculture, 286.
Monozite: 537; sources of, 537; industry, 537; uses of, 538.
Mortality: infantile, 772.
Mortgage: otti or, 153; usufructuary, 153, 177.
Mortgager: Sirkar, 202.
Mosquito control operation: 796; in Trivandrum, 796; in Iraniel, 796; Alleppey, 797; Quilon, 797.
Motor traffic: 494; condition in recent years, 494.
Muhammadans: education of, 732; table showing progress in education of, 734.
Mūkkunnimala: 268.
Mujakumaṭṭeela Kāryakkār: 50.
Municipal Councils: 803.
Munkaṛam: 1: 6.
Munro, Colonel: 132.
Murajapam: 216.
Muri: 129.
Mythical gift: theory of, 142.

N

Nadavukūr: abolition of, 193, 225.
Nadavukūr rights: 197.
Nadupāṭṭom: 200.
Nāduvāli or Rāja: 130.
Nāgam Aiya: 64; on economic position of Agriculturists, 64.
Nair chieftains: owners of the land in the state, 128; as protecting class, 138; sāmantbas, 143.

- Nair jenmies: 144.
 Nairs: 125.
 Nair tharas: formation of, 149.
 Nandāvanapram: 213.
 Nānjanād: 301; taluks comprised by, 301; irrigation of, 311, 414; varieties of paddy cultivated in, 303; podi vitha, 302; Nīr vitha, 308.
 Nānjanād irrigation: 414; in early days, 414; improvement of early works, 415, 416; Kothayār Project, 415; levy of cess, 413; special officer to fix the levy of cess, 418; conversion of dry lands into wet, 419.
 Narcotics: 284, 340; ganja, 340; tobacco, 340.
 National income: 81; assets, 89.
 Nērotti-nērpāttom: 206.
 Net lace industry: 553.
 Nidhi: 658; main features of, 658;
 Nilavāri: 144.
 Ninthan system: 312.
 Nīrkāvom: 179.
 Nirthal lands: 193.
 Nīr vitha: 308; varieties of paddy grown under, 308; preparing the field for cultivation, 303; sowing, 309; transplantation, 309; weeding, 309; harvesting, 309.
 Niṭṭupanam: 215.
- O**
- Occupatio : principle of, 129.
 Occupation : past and present, 2, 3, 12, 13; ordinary and useful, 15, 120; observations by Rev. Mateer on, 15.
 Offences, forest : 274; regulation regarding, 275.
 Oil industry : 515; coconut, 506; fish, 445, 515.
 Oils : 332; gingelly oil, 332; ground nut oil, 333; punna oil, 334; cheru-punna oil, 334; iluppa oil, 335; maṭavēṭṭi oil, 335; ṣdal oil, 336; kaṇinjōṭṭa oil, 336; pūvam oil, 336; punga oil, 336; margosa or neem oil, 336; coconut oil, 506.
 Oil seeds : 233, 332; gingelly, 333; groundnut, 333; punna and cheru-punna, 334; iluppa, 335; maṭavēṭṭi, 335; ṣdal, 336; kaṇinjōṭṭa, 336; puvam, 336; margosa or neems 336.
 Olappanam : 158.
 Olathūsi : 158.
 Olavola : 180.
 Olavotti : 180.
 Olavu : 193; Kala, 199.
 Olavupāttom : 180.
 Onakkālcho : 155.
 Orāttukāra : 319; taluks comprised by, 319; method of cultivation in, 310; natural conditions in, 310; varieties cultivated in, 310.
 Operatives : 57.
 Opium : 193; consumption of, 106; issue price of, 107; monopoly of, 602; trade in, 602; abolition of monopoly, 602.
 Oppukkānom : 158, 179.
 Opputhūsi : 158.
 Organisation : ancient, 129.
 Otti and kuḷikkānam, 206.
 Otti : incidence of, 124, 147.
 Otti ināms : tax on, 204.
 Otti theṭṭam : 202.
 Otti transactions : different kinds of, 205.
 Ottivilakkam : 204.
 Ownership : of land, 119, 127; origin of, 127; classes of community having, 133; theories regarding the origin of, 127, 128.

P

- Paddy : 28, 300; area under cultivation, 28, 300; reclamations, Kuttanād and Vēmbanād, 28, 29, 425; export and import value of, 90; paddy cultivated places, 301; varieties of paddy cultivated, 301; duration of the crop, 301; cultivation in Nānjanād, 301; varieties cultivated in Nānjanād, 303; cultivation in Eḍanād, 303; cultivation in Onāttukara, 309; cultivation in Kuttanād, 311; cultivation in hills, 317; pests in paddy, 324; punja krishi, 311; hill paddy, 317; insufficiency of paddy, 319; means and attempts to increase the output of, 319, 320; efforts to improve paddy cultivation, 324; import of paddy, 319, 638; quantity and value of paddy imported, 639; cause of increase of imports, 639; import of bran flour etc, 640; monthly import of, 641; import of Bengal paddy, 534.
- Paddy Farm : 320; object of, 320.
- Padini : 575.
- Patukulam : 154.
- Pagoda : Elamkunnappan, 145; Kaviyūr, 145; Manikantēswaram, 145.
- Palanchotta viruthi : 210.
- Paḷivāsal Hydro-electric Scheme : 47, 502; potentialities of Paḷivāsal waterfall, 502; programme of construction, 502.
- Palmyra : extraction of toddy from, 575; sugar candy from, 575.
- Palmyra fibre : export trade of, 633; quantity and value of exported, 633.
- Palviruthi : 217.
- Panakalkandu : 575.
- Panayappāttom : 153.
- Panchaphalam : 155.
- Pandārapāttom : 163.
- Pandāravakai or Sirkar property : 124 190; Govt. as land lord, 124; nature of, 192; payattupāttom, 199; kudi-jenmom, 219.
- Pandyan kal : 414.
- Pani : 574.
- Paper industry : 541; Punalūr paper mill, 541; manufacture of paper in the state, 541.
- Paper mill : 500.
- Paśaśufāma : grant of, 119; reclamation by, 127; acceptance of the reclamation theory by High courts, 127.
- Pattah : 134.
- Pattah holder : 134.
- Pattōla : 130.
- Pāttom : Kulikkānam : 177, 206; kānam, 147; ubhaya pāttom, 152; mārāya pāttom, 152; panayappāttom, 153; jenmi pāttom, 155; venpāttom, 195; kandappāttom, 195; kuthakappāttom, 195; sanchayappāttom, 198; durghasuppāttom, 198; pandāravakappayattu pāttom, 199; vettolivupāttom, 199; melvāram pāttom, 199; vijameladi pāttom, 199; adiyara pāttom, 199; karikkūr pāttom, 200; pandāravaka viruthipāttom, 200; pandāravakai puthuval pāttom, 200 nadupāttom, 200; viruthi nērpatti-pāttom, 200; vilakku pāttom, 200; miteduppu pāttom, 201; thōlpāttom, 201; kudippullithanathu, 201.
- Pāttom fee : abolition of, 197.
- Pāttom proclamation : 191.

- Pattu viṛuthi: 217.
- Payments: made by kudiyaṅs, 155; micchavāṛam, 155; ṇakkalcha, 155; panchaphalam, 155; āradiyānthiṛam fee, 155; kalaśavāṛi, 156; adukkuvathu: 156; olappanam: 158; opputhūśi: 158; ettartham: 159.
- Peas: 395; cultivation of, 326; varieties peculiar to the state, 327; cow pea, 327.
- Pēchippāra dam: 416; (see Kothayān Project).
- Pepper: 37, 344, fall in price of, 37, 620; cultivation of, 344; harvesting of, 344; medicinal use of, 344; production of, 344, 620; experiments in cultivation of, 345; varieties of, 345; standards for, 346; marketting of, 344; price of, 344; development of trade in, 580; monopoly of, 582; abolition of monopoly, 585, 591, 595; excise duty on, 591; export duty on, 591; pepper trade in early days, 518; demand for Travancore pepper, 620; markets for pepper, 620; cause of fall in price of, 620; quantity and value of pepper exported, 621; price of pepper in 1102-1111, 620; condition of trade in 1102-1111, 621.
- Pepper Farm: 345.
- Permanent Fund: 658.
- Peṛumāl period: administration, 132; extraction of revenue, 132.
- Peṛumāls: 129, 130; Pūnjāt dēśoms, of, 145.
- Piḍāka: 129.
- Pikota: irrigation with, 296.
- Pillow lace industry: 552; introduction of, 552; flourishing of, 552; revival of, 533; training given in, 552.
- Pine apple: 369; conditions for cultivation, 369; varieties of 369.
- Plague control: measures for, 785; attack of plague at different periods; 785; out-break at Alleppey, 786; plague observation work in, Dēvikulam, 787; experiments on plague research, 787; rat flea surveys, 787.
- Plantain: 365; fibre of, 338; varieties of, 366; uses of fruits of, 366, 367; price of fruits, 366; bananas, 367.
- Plantations: 282, 370; teak, 256; sandalwood, 258; coffee, 370; tea, 372; rubber, 377.
- Ploughs: 293; improvements of, 293; Climax Plough, 293; price of, 294; Meston Plough, 294; Pillikkal Plough, 294; Alway Plough, 294; popular varieties, 294; census of 298.
- Plough standard: 227.
- Podi Vitha: 302; preparing the field for, 302; manuring the field, 302; sowing, 302, 308; growing of paddy, 308; yield: 308.
- Population: increase of, 18.
- Poramboke lands: nature of, 194.
- Ports: improvement of, 481; opening of Alleppey port, 581.
- Portuguese: commercial relation with, 580, 581.
- Possession: emphasising tenant's right of, 163.
- Postal articles: conveyance of, 494.
- Postal Savings: 655.
- Pottery: 517.
- Poultry: 400; experiments conducted in, 401.
- Poultry Farm: work in, 400.

- Power : electricity, 47, 498; Hydro-electric possibilities in the state, 47, 498; necessity of electric power in the state, 47, 498; Pallivāsal Hydro electric scheme, 502; demand for power, 503; power houses in Travancore, 500.
- Power House, Trivandrum: 500; installation of, 500; capital invested, 500; utilisation of current, 500; income from, 501; power houses in other towns, 501..
- Private property : exclusive rights of, 127; Major Walker's observation on, 127; absolute ownership of, 127.
- Privy purse : 193.
- Proclamation of 1042 : to protect the interests of lords and tenants, 168.
- Proclamation of 1111 : abolition of government monopoly on royal trees, 264; Settlement Proclamation of, 185, 228.
- Proclamation : Mathilakom Service Inam, 223.
- Property : private rights of, 127; Brahmaswom and Dēvaswom: 146; exempted from taxation, 146; Major Walker's opinion on, 127.
- Proprietorship : Government, 120.
- Proprietary right : alienation of, 117.
- Protection : price of, 121.
- Protector : 129, 130; forest, 271.
- Public analyst's section : 803.
- Public Health : 758; historical introduction, 758; introduction of vaccination, 758; European system of medical aid, 758; vaccination department, 758; progress of, 759; sanitary department, 759; separation of public health and medical department, 760; Towns Improvement Regulation, 760; new scheme of, 761; laboratory, 761; post of a director, 764; health unit work at Neyyattinkara, 764; organisation of, 764; public health law, 765; Municipal Regulation V of 1095, 766; food adulteration regulation IV of 1106, 766; programme of activities, 766.
- Public Health Department : staff of, 809; programme of work, 809.
- Public Health Education : 810; health exhibitions, 811.
- Public health laboratory, 799; services rendered by, 801.
- Public health law : 765; Epidemic Diseases Regulation II of 1073, 765; registration of Births and Deaths Regulation VII of 1096, 765.
- Public health organisation : 764. 765; Director as the head, 764; District health officers, 765; health laboratory superintendent, 765; medical entomology, 765; health educational officer, 765; sanitary circle officers, 765.
- Public health scheme : 761; advice of Rockefeller Foundation, 762; Honorary Adviser of public health, 762; hookworm survey and treatment, 762; public health education, 762; co-ordination of sanitary and public health departments, 763; public health laboratory, 763; schemes for cholera prevention, 763; divisions of public health districts, 763.
- Public health services : 812; annual expenditure, 812.

Public Works Department, 466;
organisation of, 466.

Pulses : 283, 325; peas, 225; horse-
grams, 326; dhal, 327.

Punalur paper mill : 499; scope of
the industry, 500; causes of fail-
ure, 499.

Pungu oil : 336.

Punja cultivation : 287; in karap-
padams, 311; in kayal lands, 312;
in kari lands, 316.

Punja fields : 101, 311.

Pūnjār Chief : vassalage of, 188.

Pūnjār Edavakai, 188.

Pūnjāt Perumāḷ: dēšoms of, 145.

Punna oil : 334.

Purakkadam : 205.

Puṭhen Dam : 414.

Puthuval Pattom Pandārāvaka :
200.

Pūvam oil : 336.

Q

Quilon : number of factories in, 506.

R

Rāgi : 318, 325.

Railways : 491; introduction of in
the state, 491; survey and
construction of Quilon-Tinnevely
line, 491; cost of construction of
the line, 491; tunnels in the line,
491; agreement between parties
concerned for construction and
working of the line, 491, 492;
Cochin-Shoranūr railway, 493
acquisition of land for the line,
493; opening of the line, 493;
extension from Quilon to Trivan-
drum, 494; extension from Beach
to Thampanūr, 494.

Rainfall : distribution of, 286.

Rājabhōgam : 123; incidence of,
124; assessment of, 125.

Rake : 295.

Rākshābhōgam : 211.

Rakshāpuṣhan : 129.

Rāmaiyan Daḷava : 214.

Rama Iyengar, Dewan : 215; on
settlement, 228; memorandum of,
228.

Rāma Varma Mahārāja : (933 to 973);
trade and commerce in the reign
of, 582.

Rātes : uniformity of, 237; for wet
lands, 231.

Rayon industry : 542.

Reclamations : 28, 425; Kuttanad
and Vembanad, 28, 29, 312;
controversy regarding reclama-
tions, 28; Bastow's services to-
wards, 29; Puṭhenvēlikkāra Recla-
mation Scheme, 425; Vadavattūr
Reclamation Scheme, 425; Mu-
nampum Reclamation Scheme, 425;
Kaipuḷā Scheme, 425; Kainakāri
Embankment Scheme, 426; Parūr
Reclamation Scheme, 426; restora-
tion of Kallada river banks, 426;
from Vembanad kayal, 312.

Redemption: equity of, 117; exercise
of in Travancore, 117; place of
custom in, 118; Mādhava Rao's
opinion on, 118; theory of, 149;
Jenmi's right of, 159; discussion
on, 166; by Sadasivan Pillai, 166;
by Mādhava Rāo, 166; by Fisher
and Newill, 166.

Reformatory school : 734; vocational
education, 735.

Registration Agencies : 768.

Regulations : Jenmi and Kudiyan
Regulation V of 1071, 171, 172,

- 173; Jenmi and Kudiyan Amend-
ment Regulation of 1108, 174,
175; Estate Rent Recovery Regu-
lation of 1068, 187; Edavakai
Regulation III of 1109, 187; I of
1068, treating Revenue from Sri
pandāravakai lands as public
revenue, 192; Revenue Recovery
Regulation, 193; I of 1068, pro-
cedure of collection, 241; Land
Conservancy Regulation, 243;
Forest Regulation, 260, 275; Fish-
eries Regulation, 391; Toll Re-
covery Regulation, 474; Town Im-
provement Regulation, 760;
Epidemic Diseases Regulation,
765; Municipal Regulations, 766;
Food Adulteration Regulation,
766.
- Remissions : of land tax, 86; cases
of special remissions, 198; new
system of, 226, 233.
- Renewal fees : fixity of, 175
- Rent : methods adopted to recover,
154, 187; Patukulam, 154; Rent
Roll, 190.
- Rent Recovery Regulation : of 1068,
187.
- Research : 801; Imperial Council of
Agricultural Research, 410.
- Reserved forests : classification of,
248, 249; decrease of, 248.
- Restoration : reimbursement and,
164.
- Revenue : suggestion of the board of
revenue to augment, 121; claim
to, 121; Abkari, 103; from tobacco,
108; extraction of by Perumāls,
132.
- Revenue Administration: Causes for
unsatisfactory system of, 225, 226.
- Revenue Recovery Regulation: 193.
- Revenue Registrar, Madras: on
Malayalam Jenmom, 135.
- Revenue Survey: 229; different kinds
of, 229.
- Rice: import of, 638; quantity and
value of imported, 638; cause of
increase in import of, 639; import
of broken rice, 640; monthly im-
port of, 641; distribution of import
of, 641; increase in import of, 641;
Purmese competition, 641, 642.
- Road Board: 473.
- Road Congress: 474.
- Roads: 465; in early days, 465; con-
dition till 1850, 466; improve-
ment of early roads, 467; constru-
ction of new roads in the latter
half of 19th century, 467, 468;
principal roads in the state, 470;
metalling and tarring of roads,
472; concreted road, 472; constru-
ction and maintenance of, 472;
fund for the construction of, 472.
- Rockfeller Foundation : service ren-
dered by, 763.
- Royalties: of timber, 262; trees com-
ing under, 262; animal products
forming, 262; complaints regarding
rights of, 263; appointment of a
committee to settle claims of, 263;
fixed kudivila rates for, 264.
- Rubber : 2, 39, 377, 520, 628; quan-
tity and value of rubber exported,
628; fall in price of, 628, 629, over
production of, 522; control pro-
duction, 523, 629.
- Rubber industry: 520; preparation
of "first latex crepe" 521; pre-
paration of smoked sheet rubber,
520; preparation of scrap rubber,
522; aid given to the industry, 522;

progress in the state, 522; starting of rubber factories, 523; decline of the industry, 629; revival of the industry, 629; competition from Burma, 629.

Rubber Plantations : 377; preparing the land for plantation, 379; planting, 378; tapping, 378.

Rupavari : 144.

Rural reconstruction : 75, 686.

Rural latrine construction, 807.

Rural sanitation : 805.

Rural water-supplies : 806.

S

Sākshi amount : 185.

Salt : consumption per year, 44; price of, 439; self-sufficiency of, 111, 112.

Salt industry : 42, 531; right of manufacture, 531; modified excise system, 531; supervision of factories, 532; number of factories, 532; area of each factory, 532; manufacturing seasons, 533; brine supply, 533; process of manufacture, 534; yield of the factories, 535; consumption of, 535; import of, 535; former conditions of, 42; monopoly of, 43; limitations of, 43; regulation to control, 43.

Salt monopoly : 600; in British India, 601.

Sāmantha Kshatriyas : 131.

Sāmantha Nāyars : 143.

Sanchayappāṭṭom : 198.

Sandalwood : plantations of, 258; natural habits of, encouragement by Rāma Rao, 259.

Sanitation : 806.

Sanitary committee : 807.

Sanitary Department : 759; organisation of, 759; items of public health utility, 760; expansion of, 761.

Sankēthams : 131.

Sān̄thi virūthi : 217.

Sassoon mills : 503, 542.

Sathyakkuravu : 198.

Schools : [agricultural, 403; fall in the members of private, 721; increase of departmental, 721; private enterprise, 721; increase of expenditure, 721; elementary education, 721; English, 698; Sanskrit, 734; encouragement for, 737. Screw pine : 337; mat weaving, 566; stages of progress, 567; places of growth, 566.

Seasons : in the state, 286.

Seed drills : 295.

Sericulture : scope in the state, for, 401; as a cottage industry, 402.

Sēshiah Sāstri : on jenmom, 123, 135.

Settlement : first land, 224; second, 225; nature of early, 225; of 1067, 183; of 1012 M. E., 226.

Settlement Proclamation : of 993, 185; of 1061, 228.

Shark fins : 444; quantity exported, 444.

Shark liver oil : 446.

Shashtāmśā, legitimate portion of the king : 121; authorities sanctioning, 121.

Sheep : 388.

Shenkōtta : Irrigation in, 423; means of irrigation in, 423.

Silk farm : 401.

Silk yarn : preparation of, 549; import of, 547, 543.

Silk weaving : 546; introduction of, 546; thriving of, 546; decline of, 547; income derived from, 551; weaving implements, 550; bordering with gold-lace, 551.

Sirkar Deyaswomvaka lands : 219.

Sirkar dues : in money, 224.

Sirkar fee : regarding Aṭṭippēr, 179.

Sirkar lands: 190; nature of, 190; sub-divisions of, 192; tenures of, 194; acquisition by right of conquest, escheat, etc., 123.

Sirkar Otti: origin of, 203.

Sirkār pāṭṭom: 123.

Small-pox : 772; occurrence on various occasions, 773; vaccination as the remedy, 774.

Societies : co-operative, 687; marketing, 687; consumers, 687.

Soil : grouping of, 230; various kinds of, 285; of Nānjanād and Kuṭṭanād, 286; manure in, 293.

Sovereignty : united, 132.

Sowing : various methods of, 295.

Spices : cultivated in the state, 284.

Srīpādam : 145.

Srīpādam lands : 194, 241; right of appropriation of, 194; revenue to Attingal Rāpis, 194.

Srīpandāravakai lands : 190, 222; nature of, 192, 211; assessment of, 241.

Staple commodities : 38; annual whole sale products of, 33.

State : divisions for forest administration, 263; total area of, 282.

State activity : in the field of education, 700; meeting the entire cost of education, 700; Rāni Gauṛī Pārvaṭhī Bai's res-

cript, 700; insistence on inspection of schools, 700.

State Aided Bank : origin of, 661.

State Land Mortgage Bank : the purpose and scheme of, 663.

Stone-ware : manufacture of, 517; 518; raw minerals required for, 513.

Studies : different courses of, 703.

Sugar : import trade of, 642; quantity and value exported, 642.

Sugar candy : export trade of, 634; quantity and value exported, 634; palmyra, 575; uses of, 575; preparation of, 575.

Sugar cane : 36, 362, 363; area under cultivation, 36, 362; products of, 36; cultivation of, 362; manufacture of gur, 363; uses of, 362; yield, 363; varieties of, 363.

Sugar industry : 519; resources of, 519; crude forms of sugar manufactured, 519; sugar factory, 519; manufacture of refined sugar, 519; government's interest in, 519.

Sun hemp : 339.

Survey and settlement : 224, 228.

Swarūpams : 131.

Sweet potato : chīni, 332; cultivation of, 332; food value of, 332.

Sylviculture: 255; government attention towards, 255; endeavours to promote, 255.

T

Tamarind: 349.

Tanks: irrigation by tanks in Nanjinād, 421; improving of, 421, 422; irrigation in other taluks, 422.

Tapioca: 34, 327; decrease in the cultivation of, 34, 327; value of ex-

- ports of, 34; value as food, 328, 329; varieties of, 328; area cultivated, 328; cultivation of, 328; yield, 329; export of, 624; price of, 624; quantity and value exported, 624.
- Tapping: of coconut, 571; of palmyra, 575.
- Taungya system: reasons for failure of, 257.
- Tax: tree, 105, 199, 234; land, 117, 224,
- Taxation: equity of, 4; incidence of, 9; immunity from, 122; liability to, 124; different modes of imposition and collection of, 224.
- Tea: 39, 626; export trade on, 626; market for, 626, 627; export duty of, 627; quantity and value exported, 627.
- Tea-cess committee : 627.
- Tea Industry : 523 to 527; tea factories, 523; conveyance of leaf to the factory, 524; withering of leaves, 524; twisting the leaves, 525; fermenting the leaves, 526; drying of fermented leaves, 526; sorting of tea, 526; packing, 527.
- Tea plantation : 372; introduction in the state, 372; position of the state in the industry, 372; policy of government in, 372; varieties cultivated, 372; facilities for cultivation, 372, 373; preparing the land for, 373; choice of seeds, 374; yield of, 377; pruning, 377.
- Technical education : introduction of, 709; School of Arts, 710, 711; Sri Mūlam Technical Institute, 711, 712; School of Commerce, 712; Carpentry School, 711; Agricultural School, 403, 404, 711; School of Industry founded by Rev. C. Mead, 709; Medical Class, 709; Law Class, 709; suggestions for improvements, 712, 713; observation of education reforms committee on, 712; weaving schools, 712; proposal for technological education, 714.
- Teak ; plantation of, 256; first planting of, 256; area and places of, 256; extension of, 257; progress of, 257.
- Tenants : 117; condition of, 117; rights of, 163; causes for discontent of, 161, 162. status of Edavakai, 187.
- Tenant's rights : exposition of, 163.
- Tenure land : 116; fixity of, 116; notions of east coast and west coast, 116; opinion and custom regarding, 119; jenmom, 123; kānappāttom, 147, miscellaneous, 219.
- Thalivirūthi : 217.
- Thanathu lands : 133.
- Thanathuchitta lands : nature of, 194.
- Tharīśu lands : nature of, 194.
- Thena: 325.
- Thirumukha Irayili : 212.
- Thiruppuvāram : 221.
- Thiruvadayālam : 154.
- Thiruvulam : 154, 211.
- Thōlpāttom : 201.
- Thoria : preparation and uses of, 537.
- Thread work : 554.
- Threshing appliances : 297.
- Thūśikkānom : 158, 160.
- Thuyarā otti: 206.
- Tiles : manufacture of, 516; centre of, 516; tile factory employers, 516.
- Timber : value of, 252, 279; species of, 252; system of fellings of, 262, extraction of, 262, 279; royalties of, 262; transport of, 264;

- permit system, depot system, and contract system in, 264, disadvantages of depot system, 265; quantity of, 279; export of, 625, tariff value of, 625; quantity and value exported, 625; mango wood, 625; jack wood, 625
- Tobacco : quantity imported, 39; revenue derived from, 39; consumption of, 40, 103; monopoly of, 582, 585, 595; abolition of monopoly, 592; mode of selling, 585; import duty of, 590, 599; license for, 600.
- Toddy : monopoly of, 603; right of sale, 603; right of drawing, 603.
- Toll Recovery Regulation : 474.
- Tolls : 474; necessity for the levy of, 474; establishment of, 474; number at present, 475; revenue from, 475; condition of payment, 475; control of toll-gates, 476; exemption of payment, 476.
- Tortoise shell : 451.
- Town Improvement Committees : 807.
- Trade : in early times, 49; internal, 50; growth of, 50; value of 50; monopoly of, 583, 601.
- Trade Act, British Indian : 586; effect on Travancore trade, 586.
- Trade and commerce : 579 to 650; advantages of the state for developing, 579; in ancient times, 579; development due to the Portuguese, 580, 581; commercial relation with Dutch, 580; pepper trade, 581; cotton trade, 581; state monopoly of, 582, 583, 594; Marthanda Varma's efforts to improve, 580, 581, 582; Dharma Raja's efforts, 582, 584; efforts of succeeding rulers, 583, 584; increase of, 585; Interportal Convention, 586; monopolies of, 595; abkari trade, 603; economic depression, 605; export trade, 604, 608, 635, import trade, 604, 635, 644; balance of trade, 605; direction of trade, 606; distribution of external, 607, 608; Indian ports to which shipments made, 608; internal trade, 645; currency, 645.
- Transport and communication : 48; state control of, 49; development of, 49.
- Treasuries : 656.
- Trees : cultivation in former days, 2; timber, 254; varieties of, 254; most valuable, 254; seigniorage and tariff for, 254; trees yielding fibres, 333.
- Tree-tax : 105, 199, 234.
- Tunnels : at Varkalai, 478; in the railway line, 491.
- Turmeric : cultivation and uses of, 347; export of, 623; foreign markets for, 623; tariff value, 623; price of, 623; quantity and value exported, 623.
- Typhoid fever : 779; inoculation as a remedy against, 779.

U

- Ubhayapattom : 162.
- Ubhaya umpalam : 213.
- Udama umpalam : 213.
- Ullunnu or blackgram : 325.
- Umpalam : 213.
- Unemployment : causes and circumstances leading to, 61, 62, 727; Unemployment Enquiry Committee's observation, 727;

Education, one of the causes for, 727.

Unit of measurement : 645.

University of Travancore : 744; the idea of a separate University, 745; need for, 749; ideals and aims of, 749; constitution of, 752; Syndicate, 753; Senate, 753; Administration, 754; publicity board, 755; endowment funds in aid of, 755.

Uraima : 131.

Urban Banks : 682.

Ulsavakkōppu : 155.

V

Vaccines : preparation of, 784, 800.

Vaccination : 779; introduction and early progress of, 779; Royal Message regarding, 779; Royal Proclamation on the advantages of, 780, 781; vaccination campaign, 784.

Vaccinators : extensive tour of, 761.

Vaccination campaign : 784.

Vaccine depot : 782; technique of Vaccine production, 784.

Vaccination department : 758; introduction of, 758; expansion of, 759; vaccine depot, 759; administration of, 759; recommendations of the Vaccination Committee, 761; vaccination ranges, 761.

Vāla community : 392.

Valavīṭu Puṛānam : 432.

Vallavīṛuṭhi : 217.

Vanjipuḷa Pandārathil : 146.

Varkala : tunnels in, 478.

Vassals : Adima, Anubhōgam, Thiruvuḷam, Thiruvadayālam etc., 153, 154.

Vayalvālotti : 180.

Vectors : of F. Malayi, 792; their Bionomics, 792; life history of the Mansonioides, 792.

Vegetables : cultivated in the state, 284, 364; facility for cultivation of all, 364; varieties grown, 364; cultivation of, 364.

Vehicles : value of, 102.

Venpāttom : 184, 188, 195.

Vernacular education : 704, 723; the committee's recommendations on, 723; progress of, 724; Sankara Subbier as Director, 704; His observation on, 704; grants to school, 704; progress in, 708; Inspecting staff, 708.

Verumpāttom : 147, 176.

Vessels : licensing and regulating of, 480, 481; vessels exempted from licensing, 481; inspection of, 481; license for Cochin and Malabar vessels, 48.

Vettoḷivu pāttom : 199.

Vilameladi : 199.

Village communities : 129; divisions and sub divisions of, 129; Lord Charles Metcalfe on, 130.

Vilakku pāttom : 200.

Vilayarthom : 216.

Viṛuṭhi : a kind of Irayili, 195, 213; fees due to the Sirkar from tenants holding Viṛuṭhi, 214; Arayalam, 214; Aduḷkuvathu, 215; Nittu panam, 215; Vanchikaypanam, 215; Chittippanam 215.

Viṛuthikkārs : 198, 217; various classes of, 217; kūthuviṛuṭhi, 217; koṭṭuviṛuṭhi, 217; vallaviṛuṭhi, 217; ānaviṛuṭhi, 217; malaviṛuṭhi, 217; santhiviṛuṭhi, 217; kayarviṛuṭhi, 217; thaliviṛuṭhi, or chauluviṛuṭhi, 217; pāṭṭuviṛuṭhi,

217; chēmpuvirūthi, 218; kura-
virūthi, 218; sankuvirūthi, 218;
Mahābhāṣāthavirūthi, 218; nada-
kāval virūthi, 218; vedivirūthi,
218; paṣāvirūthi, 218; kaccha-
virūthi, 218; munnila virūthi, 218;
Pāliyathu Menon virūthi, 218;
Kodungallūr virūthi, 218; Perum-
padappuswārūpam virūthi, 218;
Virūthi pāttom, paṇḍāṣavaka : 200;
abolition of, 214.
Vital-statistics : Registration of,
766; arrangements for, 767.

W

Wages: mode of payment, 2; rate
of present, 58; average wages, 60;
of factory workers, 50; of labour-
ers, 99, 542.
Walker, Major : view on private pro-
perty and the prevailing custom
when transfer of jenmem effected,
127, 180.
Ward and Conner : suggestions for
the improvement of livestock, 25;
on wages, 59; on roads in the
state, 465.
Warranty: against encumbrances
from jenmi, 164; against insecurity
of tenure, 165.
Waste lands : reservation of, 121.
Water-communications : 477; con-
trol of, 480; licensing and register-

ing of vessels, 480, 481; inspection
of steam vessels, 481, 482; timings
of steam vessels, 482; boat jetties,
482; controlling and regulating of
traffic, 482; rates of fares, 483;
Cochin and Malabar vessels in
Travancore waters, 481, 483.
Watts: on the condition of trade, 52.
Wealth: 14; Madhava Rao's schemes
to increase wealth in the state, 14.
Weeding : 296.
Weeding implements: 295.
Wet-cultivation: 282.
Wet lands : conversion of dry lands
into, 410.
Wood : uses of, 255; antiseptic treat-
ment of, 276; artificial means to
increase durability of, 276; Cre-
osote and Ascu treatment of, 276.
Wood seasoning : 568; condition of
the industry, 568, 569; process of
seasoning, 568.
Woollen industry : 576.

Y

Yam : 329.
Yāppānam : a variety of coconut,
353.

Z

Zircon : 539; sources of, 539; uses
of, 539.

THE END

VOL. III.

ERRATA

[VOL. III]

<i>Page</i>	<i>Line</i>	<i>For</i>	<i>Read</i>
21	14	destributary	distributary
22	35	feritilisers	fertilisers
46	7	the certain	certain
55	34	tha	that
127	25	owership	ownership
133	25	the	be
188	6	rinciples	principles
223	15	dignitories	dignitaries
233	1	scare	scarce
247	13	then	than
251	32	nevertheless	nevertheless
256	9	Do.	Do,
257	4	adumberated	adumbrated
258	12	decends	descends
268	6	the	they
325	33	twe	two
341	32	to sworn	to be sworn
349	11	invites	invitees
379	3	out	cut
444	1	o	of
495	1	buffaloes	buffaloes
508	9	cut	but
518	35	combined	combined
527	19	omen	women
"	20	ey	they
572	13	shot	shoot
"	26	very	every
589	30	ormer	former
661	35	situataion	situation
688	34	ot	to
703	33	loyalty	loyalty to
728	1	rgiht	right
768	4	assignment	assignment
769	26	enquires	enquiries
794	22	susceptability	susceptibility

